Chapter 1
Measuring The Kansas City Innovation Economy

Objectives

Innovation—the introduction of new products or new processes of production—is the chief source of economic dynamism in the American economy and the major contributor to rising living standards. High levels of innovation generate positive results for both businesses and people, contributing both to business expansion and job creation. The economic dynamism of Silicon Valley, Route 128, and the Research Triangle area are commonly attributed to the role of these places as centers of innovation.

Creating conditions conducive to high rates of innovation is an essential ingredient in sustaining regional economic development for the future. Without innovation, regional economies risk being left behind in the emerging new economy.

With these concerns in mind, KCCatalyst commissioned researchers at the Policy Research Institute at the University of Kansas to evaluate the innovation performance of the Kansas City area. This study has been prepared to provide an objective, quantitative assessment of the level of innovative activity of the Kansas City metropolitan area and to examine the relationship between regional innovation performance and other characteristics of the regional economy.

By comparing and contrasting the Kansas City area with other major metropolitan areas and with a specially selected set of peers, this study provides a foundation for formulating economic development goals for the area.

Conceptual Framework

This study is based on a conceptual framework that links innovation performance to economic structure and regional resource endowments.

- **Innovation performance** captures regional progress in idea generation, commercialization, entrepreneurship, and new business formation.

In today’s knowledge based economy, innovation is crucial to maintaining a competitive and expanding economy.

- **Economic structure** encompasses a variety of dimensions of regional economic conditions including regional growth rates, labor market conditions, employment mix, and competitiveness that are likely to support innovation performance and economic prosperity.

- **Resource endowment** reflects the basic building blocks of economic development that an area possesses. The quantity and quality of labor skills and of technological and physical infrastructure are the inputs that shape the local economy and ultimately influence the ability of the regional economy to produce successful innovations.

In this report we quantify innovation performance, economic structure, and resource endowment using an array of indicators selected to reflect different important dimensions of regional performance. These indicators are aggregated into three indexes that summarize innovative performance and the economic structure and resources that underlie this performance.

Indicators and Indexes

The foundation of this study is the analysis of a broad array of indicators that provide quantitative measures of how well the Kansas City economy is doing—whether it is moving forward, holding its own, or falling backward in comparison with other metropolitan areas around the country.

To choose the indicators included in this study, a team of researchers at the Policy Research Institute followed a rigorous and systematic procedure to evaluate an extensive list of potential indicators. The indicators that were selected for inclusion all:

- are derived from objective and reliable data sources,
- are statistically measurable on an on-going basis,
• reflect import aspects of economic activity, and
• have clear and meaningful interpretations.

Individual indicators capture important aspects of the local economy. To distill broader measures of regional performance, we aggregate the individual indicators into three indexes reflecting innovative performance, economic structure, and resource endowments. Each index is constructed in a two-stage process. In the first stage, the indicators comprising each index are grouped into a small number of subcategories, and a subcategory index is calculated as an unweighted average of the indicators in that subindex. In the second stage, the values of each subcategory index are combined in an unweighted average to form the aggregate index.

**Metropolitan Areas**

Innovative performance, economic structure, and resource endowments are all relative. Meaningful evaluation requires comparison. The United States today is essentially an urban economy, and so the relevant units of analysis for this study are metropolitan areas. Values of each indicator for the Kansas City area are compared to 51 other major metropolitan areas.

The majority of the American population lives and works in large metropolitan areas that include both central cities and suburban areas. The largest 50 metropolitan areas account for approximately 60 percent of the nation’s workforce and economic activity. To gather data on these areas, the U.S. Census Bureau employs the concept of the Metropolitan Statistical Area (MSA). Each MSA consists of one or more counties whose economies are closely related to each other. When several MSAs are located close together, forming in effect a single economic entity, the Census Bureau designates the combined unit as a single Consolidated Metropolitan Statistical Area (CMSA).

This study compares the performance of the Kansas City MSA with that of the other 49 largest CMSA/MSAs as well as two other metropolitan areas identified by KCCatalyst as potential competitors with the Kansas City area—Madison, Wisconsin and Birmingham, Alabama. As defined by the Census Bureau, the Kansas City MSA does not include Lawrence, Kansas. Because of the close integration of Lawrence in the Kansas City economy and because of the important role that the University of Kansas plays in the area’s technology community, this study combines data from Lawrence with those for the Kansas City MSA. Similarly, we have expanded the geographic scope of four other metropolitan areas to incorporate nearby MSAs containing research universities.

A case could be made for including the St. Joseph, Missouri MSA with the Kansas City MSA as well. St. Joseph MSA is immediately adjacent to Greater Kansas City and there are mutual economic benefits from that geographical relationship. Neverthe-


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**Peer Groups**

For manageability, our detailed discussion of each indicator focuses on approximately 15 MSAs. We compare Kansas City with two groups: the top five MSAs according to that indicator and a fixed peer group, consisting of 10 MSAs considered especially comparable to Kansas City. In some cases, the peer group will overlap with the top 5 MSAs so that our comparison group will include fewer than 15 cities. (The values of each indicator in all 52 MSAs are reported in Appendix B.)

Each member of the peer group is a potential competitor to Kansas City and was selected because of their broad similarity to Kansas City along a number of important dimensions. Each has most or all of the following characteristics:
- Similar to Kansas City in population
- Midwestern
- Not a major port city
- Similar to Kansas City MSA in size of workforce in either IT or Life Science technologies
- Similar to Kansas City MSA in amount of university research funding

Madison MSA was included in the peer group, even though it is considerably smaller than Kansas City MSA, because it is an especially tough competitor in Life Science technologies, an area in which Kansas City aspires to become much more competitive.

**Interpreting Comparisons**

For each indicator, there is a table of the comparison group MSAs showing three different statistics related to the indicator. The first data column in each table is the raw indicator itself.

The second column shows the rank of each MSA with respect to that indicator. A “1” on this ranking scale always represents the best, biggest, highest priced, or most competitive MSA. Usually “52” represents the worst ranking; but in few cases where data for some MSAs are missing, the worst ranking is a number less than 52.

The third column shows a percentage index calculated by comparing the indicator for that MSA with the top ranked MSA in such a way that “100%” represents the top ranked MSA. There are three ways of doing this, depending on the type of indicator.

- Most commonly, the percentage index is simply a ratio of the two indicators.
- In the case of “reverse indicators” (like unemployment) where large is bad and small is good, the index for the smallest indicator is set to 100%, the index for the largest is set to 0%, and the others are calculated proportionately in between.
- In the case of indicators which have negative as well as positive values (such as certain growth rates), the index for the largest positive is set to 100%, the index for the largest negative is set to 0%, and the others are calculated proportionately in between.

We report the aggregate indexes in a similar way. The first column reports the “value” of the index. The second column reports the MSA’s rank, and the third column reports a normalized index value. The “value” of the aggregate index is an average of the percentage indexes of individual indicators. If an MSA was the top ranked for each indicator, this value would reach a theoretical maximum of 100%. Since no MSA is ranked highest in all indicators, however, the actual maximum in each case is less than 100%. So the normalized values are calculated by setting the highest rated MSA’s value equal to 100% and expressing all other MSA index values as a percentage of this maximum value.

**Types of Indicators**

The indicators used in this study can be divided into two general types:

- **“Quantity” or “extensive” indicators.** These indicators measure the total amount or size of something in the MSA (e.g. income, population, output, or business startups). These indicators are important because sheer size can lead to competitive advantages based on “synergies” — or in economic terms, economies of scale, scope, or agglomeration. (On the other hand, large size can also cause disadvantages such as congestion and high land prices.)
- **“Quality” or “intensity” indicators.** These indicators measure the level of success or competitiveness on a unit basis (e.g. average income per household; dollar value of new IPOs per capita). Some of these indicators consist of quantity indicators normalized by dividing by population or labor force (e.g. income per capita). Other quality indicators do not need to be normalized any further (e.g. average educational attainment).

Price or value indicators are a special case of quality indicator because they are double-edged. The situation looks very different from the competing points of view of buyers and sellers of the same good.

- **Benefits to suppliers.** From the point of view of a local supplier of labor, land, or products, high prices are a positive indicator of economic success. High sales prices, high wages, and high prices of export goods tend to show a high level of non-local demand for locally produced products. Products in high demand can support a relatively high income and standard of living.
However, the standard of living depends not only on income and wages, but also on local prices paid by households. Thus, just to stay even, workers facing the extremely high housing prices of a city like San Diego need to have a much higher income than workers facing the moderate housing prices of a city like Kansas City. Therefore, when comparing price effects on the standard of living for suppliers across different MSAs, we need to correct prices for the local cost of living. This kind of comparison is a performance indicator, in which high prices are good and low prices are bad.

- **Benefit to purchasers.** On the other hand, high prices of inputs such as land and labor tend to cause a competitive disadvantage to business by cutting into profits. Other things being equal, businesses that produce nationally or internationally traded goods tend to locate in regions with low costs of land and labor. For this kind of comparison, the local cost of living is irrelevant—a dollar cost is a dollar cost, no matter where it is paid. This kind of comparison is a resource indicator. It is also a reverse indicator, in which high prices are bad and low prices are good.

The dollar cost of inputs is an incomplete measure of resource cost, however, since the total cost depends on productivity as well as price. In other words, if a high-wage worker is paid twice as much as a low-wage worker but produces three times as much, then the total cost of production is lower using the high-wage worker. Unfortunately, no productivity data are available for making comparisons across MSAs. We will return to this issue in the detailed discussions.

In general, all dollar values have been translated into 2002 values using the GDP deflator. Where cumulative values are taken across several years, the results are expressed on a per-year basis. In a few cases, we have made an additional adjustment for cost-of-living differences across MSAs.