Introducing, understanding, and using the ICI 300 Peer Cities Identification Tool

by Taz George, Susan Longworth, and Mark O'Dell

Municipalities, especially those that are mid-sized or smaller, often face significant challenges in providing services and amenities to meet the needs of their diverse and changing populations. Solutions are usually context-specific and must factor in larger demographic and economic trends, in order to be effective. And, yet, in spite of contextual differences, cities frequently have meaningful similarities. However, identifying peer cities is often informed more by conversation than by data or evidence.

The Peer Cities Identification Tool (PCIT) developed by the Community Development and Policy Studies (CDPS) Division of the Federal Reserve Bank of Chicago is a data comparison and visualization instrument that can help policymakers and practitioners understand a municipality in the context of peer cities. The tool stems from the Industrial Cities Initiative (ICI), a study that originally profiled ten midwestern cities with manufacturing legacies, at least 50,000 population and at least 25 percent employed in manufacturing in 1960, and how they have fared in socioeconomic terms over time.[1]

The original study generated a great deal of attention among leaders of cities with comparable histories. The PCIT is in part a response to inquiries from these leaders as to how they "compare" to similar cities both within the region and in other regions of the country, as well as in response to a stated need/desire to share and learn from best practices to address entrenched municipal challenges.

The PCIT is different from other "city-data" tools in that it is not a ranking, but a comparison tool that provides the user with a baseline of data from which to ask questions and interpret and apply the answers. This approach is based on a fundamental belief that every city is different, possessing its own assets and liabilities. Usually no one is more aware of the "municipal balance sheet" than the people who live in and lead a city.

The PCIT allows city leaders concerned with community and economic development issues to identify groups of cities experiencing similar trends, challenges, and opportunities along economic, demographic, social, and housing dimensions. Using data on 300 cities from the 2010-2014 American Community Survey, as well as longitudinal historical census data, the PCIT performs a cluster analysis to identify similar cities. The 300 cities located nationwide have a common baseline: a population of at least 50,000 in 1960. Today, the 300 cities have a median population of just over 100,000.

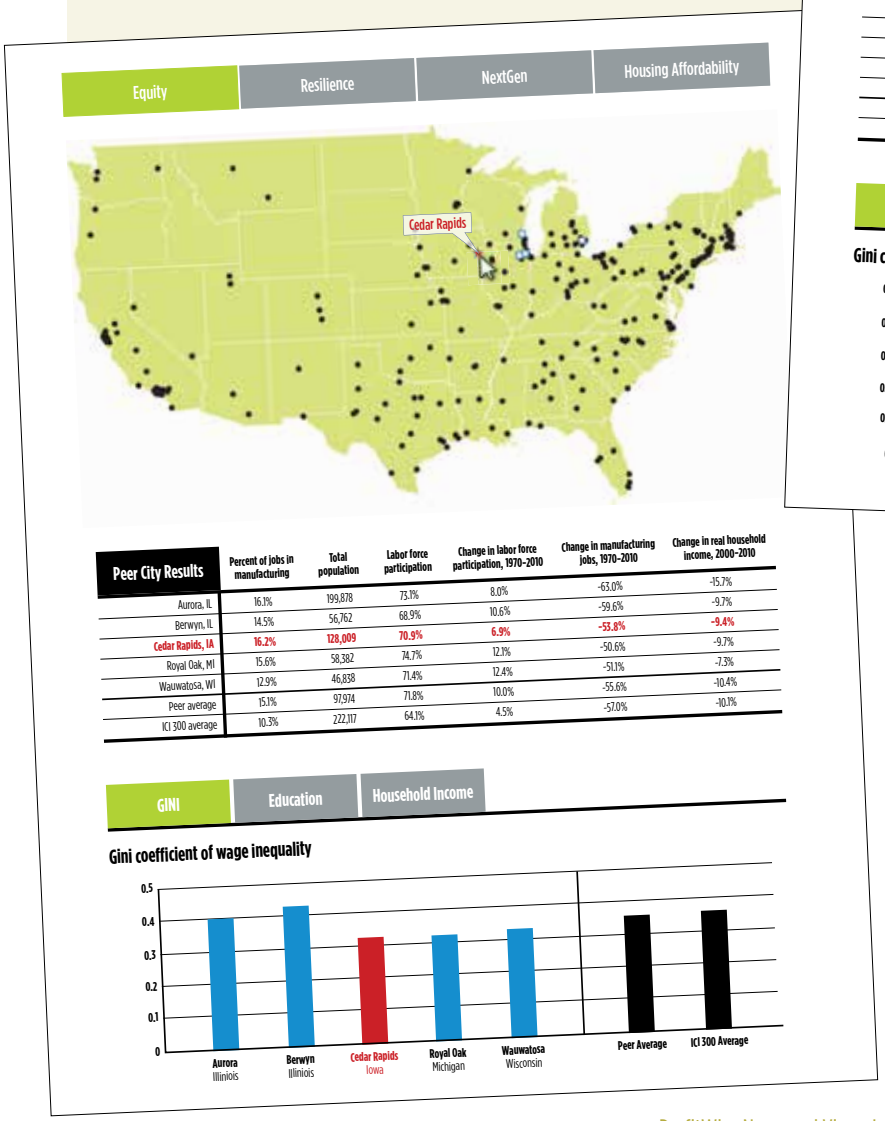
Understanding the themes

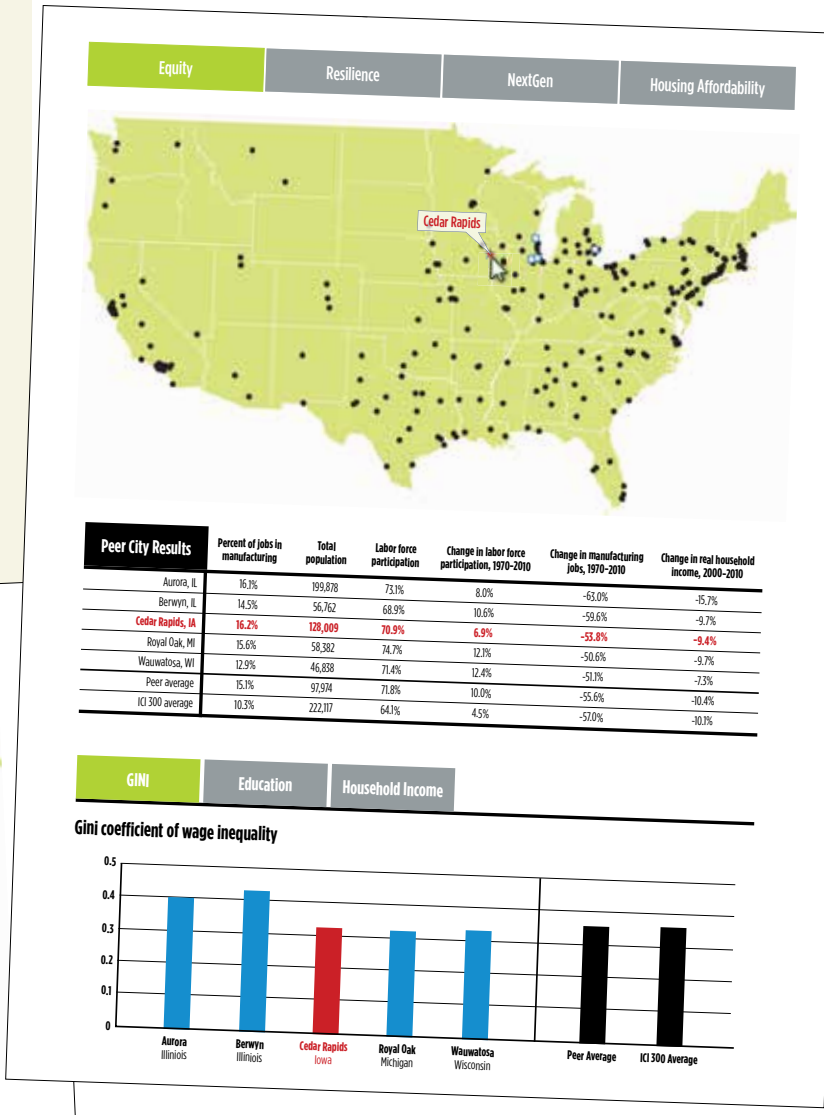
Peer cities are grouped along four key themes (others may be added at a later time), which are essentially 'portals' to the data. These themes are designed in response to key areas of concern voiced by city leaders following more than 200 interviews across almost a dozen cities as part of the ICI and other place-based research.

- **Equity** addresses questions regarding inclusion, access, and diversity using wage-based Gini coefficient, race and ethnicity-based dissimilarity indices, changes in poverty levels, and educational attainment. City leaders cited challenges of creating and implementing inclusive growth strategies that attract new businesses and jobs to their cities, while creating policies that allow marginalized populations to benefit from these new opportunities. The PCIT uses the wage-based Gini coefficient (as opposed to the income-based coefficient more frequently used)

How it works

From the PCIT website, users enter a city and select one of four themes off which to base their analysis: 'Equity, Affordability, Resilience, and Outlook.' Users first see a map of the United States highlighting the identified peer cities – usually between five and 15 cities. While often peers are geographically proximate (i.e., within the same general region of the country), sometimes a peer search can yield surprising results. The PCIT will also present the user with data from the peer cities and a table of key variables that were used to identify the group. In addition, the tool generates peer median, minimum, and maximum for each variable, as well as the ICI 300 median for the selected variable enabling comparison across and within the cities, in addition to the (full) dataset. This perspective can provide further context, especially in identifying areas in which the subject city might deviate from its peers, which can serve to highlight particular challenges or opportunities. Users can also select variables to graph or chart, providing a useful visual. All data and images can be exported.





The images presented here are samples of PCIT maps and charts.

to focus in on wage-earning workers who have been employed for the full year.

- **Housing** speaks to issues of affordability by incorporating data relating to homeownership (income-to-home value ratio) and renting (rent burden), the quality and competitiveness of housing stock by using the age of housing as a proxy, and monthly living costs. Providing competitive housing affordable and attractive to both renters and buyers was a primary discussion point among leaders.

- **Resilience** speaks to issues related to economic diversification in terms of changes in manufacturing employment, existing levels of manufacturing employment, labor force participation, and unemployment. Many cities experienced economic shocks during the Great Recession, but had experienced decline along these measures during the preceding decades. Economic diversification and labor force conditions provide broad insights into areas of vulnerability and strength.

- The **Outlook** theme explores signs of a city's demographic and economic future by incorporating changes in the working age population, family composition, and mobility (over time). Changes in the age distribution of a population, net migration, and household size and composition, can all provide clues about a city's future. Cities experiencing unusual demographic shifts may look to peers undergoing similar shifts, and to (non-demographic) factors, such as employment and educational opportunities, that may be drivers.

Methodology

The tool works by performing a hierarchical cluster analysis on all 300 cities, using the variables included in the selected theme. A cluster analysis is a way of grouping data based on the similarity of responses to several variables. A cluster analysis treats the subject city data as a "case" and will find "similar" or "peer" cases based on several variables. The clustering method used is Ward's method, which minimizes the variance across all variables in a given group.[2] If a cluster produces only a small number of results, the program has the option of using the ranked values instead of the normalized values, which tends to produce more evenly distributed groups, but does not allow for easy distinction between extreme outliers and more typical cities. The cluster containing the focus city is squared off for ease of explanation and verification, by looking at the maximum and minimum values for each variable within the cluster and including all cities within the given range for each variable as peer cities for the focus city. Finally, the program produces a table of all the included variables for all peer cities in the cluster.

As mentioned above, the PCIT has several potential uses. For many municipal planners, comparison cities are often, for practical reasons, limited to those that are geographically proximate, subject to similar regional trends, and to the planner's personal knowledge and familiarity. Sometimes, this is satisfactory, for example, when planners may want to understand cities subject to similar statewide policies or conditions. However, at other times this purview is limiting and frustrating to planners and other practitioners who wish to go outside of their 'familiarity zone' to interact with other places that may be experiencing similar challenges or changes. In particular, cities that have experienced changes in their economy, with respect to manufacturing employment, for example, may find it useful to learn about cities outside of their specific region.

To this end, the PCIT will return cities that may not initially appear to be peers – the most evident difference is often that the peers are in very different regions of the country – but that upon closer look are experiencing similar conditions, at least along one of the variable clusters. Different variable clusters will return different sets of peers – occasionally there will be common cities across the theme-based peer groups – and additional data exploration can often shed light on similarities and differences. Usually, however, the PCIT peer group will include regionally proximate cities, as the methodology used specifically seeks to minimize variance across clusters.

While the PCIT can be a useful comparison tool from which to initiate planning discussions, it is not a planning tool per se. Users are cautioned against taking high level, longitudinal data as a directive or prescription in any way: each of these cities is unique, with its own distinct characteristics. However, as the case study (see page 7) illustrates, it can be helpful in answering a specific question (about housing, for example). It can be especially useful in informing, without judgment or qualification, broader discussions.

Note: We expect to bring the PCIT online in the first quarter of 2017, and will provide an update in the next edition of ProfitWise News and Views.

The Peer City Identification Tool sheds light on Iowa City's housing affordability challenges

by Taz George

Iowa City, Iowa, is home to the University of Iowa main campus and is the principal city of a metropolitan area with a population of 166,498,[3] located in eastern Iowa about 30 miles south of Cedar Rapids. Iowa City faces acute affordable housing challenges, with a majority of rental households spending over 30 percent of income on rent. Adding to the challenge, the quantity of university-owned (and developed) student housing has not kept pace with the growth of the student population, leading students to seek housing in the private market and pressuring the supply of affordable housing for the general population, roughly 14 percent of whom (metro area-wide) are employed by the university. For more in-depth information about Iowa City's housing issues, see article on page 9.

In June 2016, the Housing Trust Fund of Johnson County in Iowa City hosted a local housing affordability conference, with CDPS as an organizing partner. The Fund asked CDPS to quantify the severity of Johnson County's affordability challenges relative to otherwise comparable areas, to explore potential factors impacting these challenges, and to present those findings at the conference. Using the Peer City Identification Tool (PCIT), we were able to provide context to Iowa City's (the city represents roughly 52 percent of the county population) affordability challenges and identify possible factors underlying the area's rising cost of rent relative to income.

The PCIT allows users to select a set of variables (relating to housing, equity, resilience, and others) from the ICI dataset, which are used to identify peers from among roughly 300 cities. For this analysis, a mix of general economic and demographic variables, including employment rate, labor force participation rate, total population size and growth, educational attainment, race and ethnicity, and geographic region, were used. Housing-related variables were omitted from the peer selection process, in order to identify otherwise similar cities, as a comparison for Iowa City's affordability issues. While Iowa City is not among the cities included in the PCIT (its population in 1960 was too low to meet the 50,000 threshold), it was added to a custom dataset for the purposes of this analysis, and supplemented with about 20 additional data points gathered from the American Community Survey.

The PCIT identified five peer cities to Iowa City: Topeka, Kansas; Duluth, Minnesota; Springfield, Missouri; Asheville, North Carolina; and San Angelo, Texas. These cities were included in a comparison sample along with Ames and Cedar Rapids (Iowa) due to the local audience's familiarity with these places. We then collected and visualized a variety of housing data on the sample group at the county level,[4] including the cost of rent from 1980 to 2014, the rate of high and severe rental cost burden, the rental and overall vacancy rate, the share of the population enrolled in a university, housing tenure and structure composition, and the homeownership rate. Among other findings, the data showed that Johnson County's cost of rent grew more rapidly than its peers, that its level of rental cost burden is comparatively high, and that its students account for a much larger share of its population than all but one of its peers. Johnson County's housing stock also stood out for being dominated by small multifamily rental structures. An overall takeaway was that Johnson County's housing challenges shared some common ground with Story County, where Iowa State University is located, in Ames. The conference organizers hoped to use this data as a basis for greater collaboration and information sharing between the two areas.

Conference attendees were intrigued by the comparison across peers, and several expressed desire to see different comparison samples. For example, it was suggested to compare only to other cities where a large university is located, as that proved to be a key distinguishing factor for Iowa City among its peers. By identifying cities that were not 'natural' peers, for example Asheville, North Carolina, participants were able to broaden their frame of reference. The PCIT was useful in identifying baseline areas of commonality between places, which laid the foundation for further data collection, analysis, and collaboration.

The PCIT empowers policymakers, researchers, and practitioners from cities large and small to conduct customizable analyses for their own purposes. CDPS' experience in Iowa City demonstrates the ability of this tool to better inform community development practices by facilitating access to data across geographies to address timely policy questions.

Notes

1. For more information on the Industrial Cities Initiative, please visit https://www.chicagofed.org/region/community-development/community-economic-development/ici/index.
2. For more information regarding Ward's Method, the original article detailing the method is publicly available at http://homes.mpimf-heidelberg.mpg.de/~mhelmsta/pdf/1963%20Ward%20JASA.pdf.
3. According to American Community Survey 2015 1-Year Estimates.
4. PCIT matches based on city-level data. For the presentation, county data was used as conference attendees were interested in affordability challenges throughout Johnson County, not just in Iowa City.

Biographies

Susan Longworth is a senior business economist in the Community Development and Policy Studies Division of the Federal Reserve Bank of Chicago.

Taz George is a research analyst in the Community Development and Policy Studies Division of the Federal Reserve Bank of Chicago.

Mark O'Dell is a research analyst in the Community Development and Policy Studies Division of the Federal Reserve Bank of Chicago.

Tenth Biennial Federal Reserve System Community Development Research Conference

MARCH 23-24, 2017 | WASHINGTON, D.C.

STRONGFOUNDATIONS

THE ECONOMIC FUTURES OF KIDS AND COMMUNITIES

Registration is open! To register, please visit the conference website at www.minneapolisfed.org/2017CDResearchConference. Registration for the conference will remain open until February 24, 2017, or until capacity is reached.

The Federal Reserve System Community Development Research Conference is a unique event that convenes researchers, policymakers, and practitioners across sectors to consider important issues that low- to moderate-income people and communities face.

The 2017 conference will explore the interplay between the development of kids and their communities, with an understanding that "development" factors into key economic and social aspects of kids' lives. High-quality and emerging research from multiple disciplines will be presented in a dialogue with policymakers and community practitioners who can utilize the lessons gleaned from the research. This event will spotlight research that can inform questions about key drivers to success, differences across subpopulations, scalable intervention strategies, and policy considerations. The conference will also feature remarks by Federal Reserve leaders, including Federal Reserve Chair Janet Yellen.

This conference is open to the public. Attendance by academic, government, nonprofit, and foundation employees is strongly encouraged. If you have questions about the conference or registration, please email CDConference@mpls.frb.org.