

What more than 400 million job postings reveal about regional workforce skills

Researchers' analyses and interactive map reveal how employer demand drives localized skill specialization

By Ayrel Clark-Proffitt, ASU News
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When it comes to job postings, more isn't always better.

Instead, it is the skills listed in those postings — and their complexity and sophistication — that can help regional planning councils identify potential areas for economic growth, attract new business and secure higher-wage jobs for their area, according to [Anthony Howell](#), associate professor in the [School of Public Affairs](#) at Arizona State University.

To better highlight skill complexity by region, Howell developed the [Geography of Skill Specialization and Complexity interactive map](#), which provides the most comprehensive geographic analysis of employer skill demand to date.

The concentration of more specialized skills in a region matters because "areas with more complex, sophisticated skill clusters tend to have higher incomes," Howell said.

The project visualizes skill demand, local specialization and complexity at the county level based on more than 433 million job postings from 2010–2024.

The dashboard and accompanying [working paper](#) — co-written by Howell, Watts Endowed Professor [Maryann Feldman](#) and colleagues from University of North Carolina at Chapel Hill, the University of Oregon and Carnegie Mellon University — represent a more nuanced approach to economic specialization and diversification.

Publicly available national labor market data, such as the U.S. Bureau of Labor Statistics Occupational Employment and Wage Statistics reports, provide job counts by sector and metropolitan areas. But it is not granular enough to highlight skill demand, Howell said.

The new analysis fills that gap by giving cities and regional economic councils the place-based data needed to pursue smart specialization policy.

A smarter way to approach economic growth

Smart specialization is an economic development approach that allows regions to identify what skills or capabilities to pursue based on its existing strengths, adjacent skill sets and ability to compete with other regions.

The open-access, county-level data provided by the Geography of Skill Specialization and Complexity project helps policymakers make informed decisions on which skills to prioritize through training programs, credentialing and investments.

“If a place pursues lots of different skills in which it has no background, understanding or knowledge at all — and spends lots of money trying to develop these skills that are so unrelated to anything ever done in that location — the evidence is pretty clear that it's a very risky policy,” Howell said.

Maricopa County, for example, has excelled in the areas of microchip manufacturing and fabrication plants due to its relatively long history in semiconductor work.

When [Taiwan Semiconductor Manufacturing Company](#), or TSMC, decided to develop a physical presence in the United States, it chose Arizona as its hub because the area was a leader in some of the necessary skills, Howell said.

“Phoenix sits in the top 3% of all U.S. counties on skill specialization and complexity, yet trails many of its aspirational peers — Austin, Dallas, Seattle, Denver, Salt Lake — on both measures, despite posting more jobs than any of them,” Howell said. “Phoenix's demand is big, but it is less distinctive and less complex than the metros it competes with for firms.”

Leading on volume is not the same as leading on sophistication. Applying the smart specialization logic to Maricopa County reveals where that gap could close.

Howell points out that the data highlight capabilities the region has not yet specialized in but are adjacent to the semiconductor skills where it already leads: advanced chip design, such as system-on-a-chip architecture; fab automation, such as advanced process control; and AI-driven yield analytics, including anomaly detection.

Diversifying into industries that draw on skills already present in the workforce is generally easier than building an entirely unrelated industry from scratch and can strengthen a region's economic resilience, said Feldman, whose recent research focuses on place-based skills and the factors that promote economic restructuring.

Sol power

The Geography of Skill Specialization and Complexity project analyzed 433 million job postings from Lightcast, a global labor market analytics company that aggregates unique job postings from more than 50,000 online sources. It added up to a terabyte of data. School of Public Affairs Associate Professor Anthony Howell turned to [Sol](#), ASU's nationally ranked supercomputer, to analyze the massive dataset. ASU researchers interested in using Sol can make a request through [Research Computing](#).

“A region heavily dependent on a few industries is vulnerable to industry-specific shocks. But simply recruiting unrelated industries is not necessarily an effective diversification strategy,” Feldman said. “Skill-relatedness measures could help a city like Phoenix pursue related diversification that draws on overlapping capabilities while exposing the region to different markets.”

Feldman believes that the data could change how we think about careers and education. Right now, the research focuses on economic planning, but in the future, it could help students explore different career paths and encourage universities to offer more flexible degree programs focused on skills rather than occupations.

“Instead of asking ‘What occupation should I pursue?,’ a student could ask, ‘What portfolio of skills will give me the greatest number of good career options in the places where I want to live?’” she said. “That could make graduates — and, by aggregation, the regional economy — more adaptable when technologies and industries change.”

The School of Public Affairs is part of the [Watts College of Public Service and Community Solutions](#).

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