BROOKINGS

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Workforce of the Future Initiative

Center for Universal Education, Global Economy and Development Program

The pace of innovation is accelerating. In the last three decades, we have seen the advent of machine learning, advanced robotics, and powerful computers. These productivity-boosting technologies benefit society but also bring challenges—disrupting the supply of good jobs, as well as the demand for new skills.

Automation is leading to a bifurcation of work, with middle-skill jobs eroding while high- and low-skill jobs are increasing. The bifurcation itself is causing widespread income inequality, especially in advanced economies such as the United States. Wages for low-skill jobs are decreasing, and people find it difficult to transition to higher-skill work. Workers are becoming discouraged by the labor conditions and dropping out of the labor force at an alarming rate. These trends threaten one of the most potent mechanisms for sustained economic growth—a thriving middle class.

Motivated by these questions, the Center for Universal Education (CUE) at Brookings has launched the Workforce of the Future Initiative. The initiative seeks to help policymakers and companies better diagnose and prepare for these trends. It seeks to provide city by city analysis to help policymakers attract industries that provide good jobs, and support workers transitioning to those jobs.

WORKFORCE OF THE FUTURE INITIATIVE

The Workforce of the Future Initiative will analyze industrial and occupational transitions shaping the future of work at the local level. With a detailed understanding of which industries are likely to grow and decline, the initiative will map the necessary occupational transitions required to host growth industries, helping leaders identify skill gaps that need to be addressed. The initiative will focus on three audiences:

- *Cities and regions.* Cities and regions need a proactive strategy to build capabilities and attract industries with good jobs. As new technologies become ubiquitous and production becomes more modular and fragmented, the opportunity for a broader set of regions to be part of global supply chains emerges. Places that can attract industries that match their current labor characteristics—while upgrading their workers' skills and attracting new skills they need—will ultimately create prosperity. The initiative will help cities understand and shape their industrial trajectory by attracting or building the skills required to accelerate growth.

- *Policymakers and skill-building institutions.* Linking industrial transformation to the occupations and skills that may experience increased demand can help the business sector, local governments, and skill providers adopt more effective educational and training policies. The initiative will provide specific, city-level insights on the occupational skills required as industries emerge and evolve.

- *Firms.* Understanding likely occupational transitions can also help firms think strategically and long-term about talent development. Understanding which existing occupations lead to

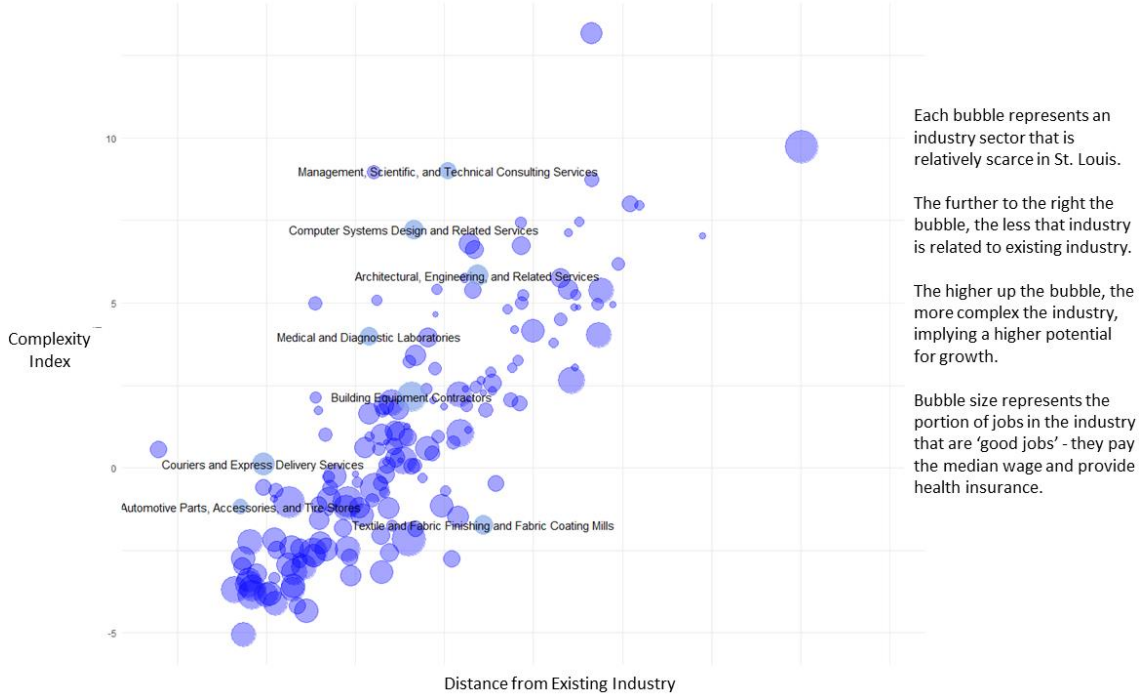
high-demand occupations of the future can help firms focus their re-skilling efforts and become more resilient as they adopt cutting-edge technology.

Stagnated wages, bifurcation of job skills, rise of contract work, and adoption of automation are all transpiring at an increasing speed—with few policy options that include the private sector. Yet the private sector is indispensable in helping workers embark on a life-long learning journey that will increasingly require different stakeholders in society to play a role.

METHODOLOGY:

Industrial transformations have occured throughout history, and for the most part follow a predictable pattern. Our methodology uses a mapping technique to visually depict the relationship between industries based on the complementary inputs they require. Using production data at the U.S. county level, the initiative will model the "Industry Space," a network or map of industries within a city. Using the predictive capability of network science, the "Industry Space" can help predict the range of industries a city is most likely to develop—based on which industries it already has—and which are likely to decline in the next decade.

Figure 1. The Industry Landscape and Opportunities for Growth, St. Louis, MO



Source: Brookings Workforce of the Future Initiative calculations using EMSI data, 2016.

The graph includes all industries (tradable and non-tradable) and shows what industries are likely to appear given that cities diversify in a predictable pattern. The analysis can predict which industries are more attractive and likelier to thrive in a location.

Predicting effects on occupations and skills. The skills required for new industries to thrive are determined by the occupational composition of the industries, specific to location. Linking existing data sets on skills related to occupations and occupations related to local industries can help predict the growth and decline of occupations, as well as the skills required to fill the occupational gaps.

Moreover, by analyzing worker transitions between jobs, the initiative will identify retraining opportunities inside and outside companies that lead to workers' upward mobility.

These insights can help policymakers, "skill building" organizations, and companies prepare the workforce of the future.

IMPACT AND PARTNERSHIPS

In its first year, the initiative will use its research findings to produce and disseminate insights relevant to both public and private sector decisionmakers, and make the recommendations actionable. CUE will work with partners to build an easy-to-access online platform for policymakers, researchers, executives, and various other stakeholders.

Figure 2. City-level Diversification through Time Using "Industry Space"

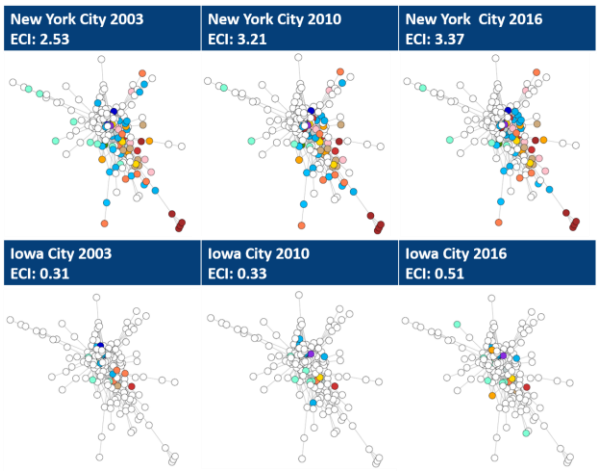


Fig 2. Workforce of the Future Initiative analysis of county business patterns data from the U.S. Census Bureau.

Figure 3. Economic Complexity Index of U.S. cities, 2016

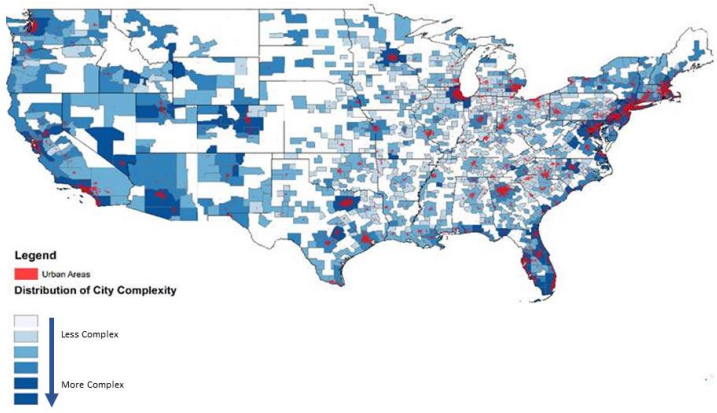


Fig 3. The Economic Complexity Index (ECI) is a measure of economic complexity in a city, based on the industries it holds (darker blue is more complex). Census 2016, County Business Patterns, American Community Survey, original calculations by Juan Pablo Chauvin (2018).

The initiative will initially review three U.S. cities as impact case studies, but will be relevant for the entire U.S. The three cities will represent different levels of economic complexity and paths toward growth and better jobs.

As it progresses, the initiative will identify and validate a wider agenda of policies at the city and firm-level that can help promote resilience in workers and economies in the face of a rapidly changing landscape.

If you are interested in participating or learning more about this initiative, contact Marcela Escobari at mescobari@brookings.edu.