Opportunity Industries

Exploring the industries that concentrate good and promising jobs in metropolitan America

By Chad Shearer and Isha Shah

Autumn 2018

Table of Contents

Introduction 3

Defining Opportunity Industries 5

Findings 7

1. Promising career pathways depend on the availability of good jobs 7

2. Opportunity industries concentrate good jobs for workers without college degrees 12

3. Metropolitan areas contain different concentrations of good and promising jobs 16

Conclusion 21

References 23

Technical appendix 24

Acknowledgments 31

Notes 32

# Introduction

In recent decades, technological change and the global integration it enables have been rapidly reshaping the U.S. economy. Digitalization, automation, and expanding global trade have vastly improved the potential of some individuals and firms to thrive but have diminished prospects for others. New technologies and trade shocks have claimed scores of decent-paying jobs and rendered certain skills obsolete, altering the pathways available to those individuals striving to reach or maintain their place in the American middle class.

Although this process of economic progress is not new, the accelerating pace at which technology and trade are changing work and society makes it harder for many individuals, institutions, and communities to adapt, contributing to growing disparities between both people and places.

As economic progress continues to tilt the labor market toward more advanced and select sets of skills, how and where will individuals find durable sources of good jobs? Experts have devoted increasing attention to this question at the national level. However, relatively little research explores pathways to labor market opportunity in individual metropolitan areas, the relevant economic context for most American workers and jobseekers.

Moreover, the debate about how best to promote upward mobility often begins and ends with a focus on education and skills. If workers can just obtain more education and job-specific training, the argument goes, they will become more productive, more resilient to economic change, and better able to earn higher wages. And there is no shortage of evidence demonstrating a clear link in the United States between educational attainment and income. Yet there remain tens of millions of adults who are already part of the American workforce, and whose work schedule, family obligations, or financial situation preclude them from investing significantly in further education and training. These workers deserve a shot over time at obtaining better jobs, with higher pay and benefits.

This report asserts that the structure of regional economies—in particular, the kinds of occupations and industries present, and relationships among them—can influence outcomes for these workers. It identifies and explores a concept we call *opportunity industries*. These are the sectors of the economy that, based on a first-of-its-kind analysis of workers’ experiences over time, appear to offer the best chances for individuals—particularly those without four-year college degrees—to obtain a *good* job, one that provides stable middle-class wages and benefits. We examine the presence of these jobs and industries within the nation’s 100 largest metropolitan areas, and how pathways to those jobs—including through *promising* jobs that represent stepping stones to good jobs over time—may differ for workers by race, gender, and educational attainment.

This report proceeds by first describing the definitions used to identify good and promising jobs and the opportunity industries that contain them. The report analyzes in turn: (a) the occupations accessible to sub-baccalaureate workers that contain good and promising jobs, and how workers tend to access them over time; (b) the characteristics of industries that tend to concentrate those occupations; and (c) the availability of good and promising jobs across major metropolitan areas. Detailed information on each metropolitan area is available in an accompanying web-based interactive tool. The report concludes by suggesting how local actors in business, economic development, and workforce development can use this information and insight to sustain and expand labor market opportunity in their communities.

Overall, the findings of this report should inspire cautious optimism about the future of labor market opportunity in metropolitan America. Although we find a shortage of opportunity across metropolitan areas, the dynamism necessary for adapting to this period of accelerating economic change is already a fundamental part of how local labor markets function. The challenge for local leaders is to harness this dynamism by growing and improving jobs in opportunity industries that encourage, rather than inhibit, upward mobility.

# Defining Opportunity Industries

Leaders in metropolitan areas—elected officials, presidents of colleges and universities, CEOs of local businesses, heads of major nonprofits and philanthropies—are focused on how they can promote opportunity for more individuals and families in their communities. And for good reason, as economic growth over the past several years has not consistently translated into improved outcomes for all residents. According to Brookings’s latest Metro Monitor, only 11 of the nation’s 100 largest metro areas managed to grow their economy, improve standards of living, and deliver increased employment opportunity and earnings for a broad segment of their populations in 2016.[[1]](#endnote-2)

Metro areas are a critical geography for achieving inclusive economic growth. They represent the local labor markets in which most Americans live and work. Moreover, U.S. adults who do not possess a four-year college degree—many of whom have struggled to achieve and maintain a foothold in the American middle class in recent years—rely chiefly on their local labor markets to provide opportunities to gain knowledge and experience as they work their way toward better-paying jobs and, hopefully, economic security.[[2]](#endnote-3)

Accordingly, this analysis aims to reveal both *where* individuals, especially those without four-year college degrees (whom we refer to as *sub-baccalaureate* workers), can find good jobs that provide economic security, and *how* individuals can navigate local labor markets to obtain these good jobs. To do this, we define and measure three types of wage and salary jobs in each of the nation’s 100 largest metropolitan areas:[[3]](#endnote-4)

* ***Good* jobs pay at least a metropolitan area’s median annual earnings for currently employed, full-time, year-round sub-baccalaureate workers and provide employer-sponsored health insurance.**[[4]](#endnote-5) Setting the pay threshold in this way ensures that it reflects variations in pay and costs of living across metropolitan areas.[[5]](#endnote-6) This threshold ranges from a low of $13.78 an hour, or about $28,660 per year, in the McAllen, Texas metropolitan area to a high of $22.46 per hour, or about $46,710 per year, in the San Francisco, Calif. metropolitan area.[[6]](#endnote-7) Employer-sponsored health insurance serves as a proxy for the availability of other benefits, such as paid leave and retirement benefits.
* ***Promising* jobs are entry-level positions that provide career pathways to good jobs.** Promising jobs do not meet the criteria for a good job but, based on an analysis of historical job-switching patterns and projections, will enable an incumbent worker to reach a good job within 10 years. We use a first-of-its-kind analysis of past occupational mobility trends to estimate how workers will move—or not move—between occupations over the next 10 years, based on projected job openings and demographics of incumbent workers in each metropolitan area.[[7]](#endnote-8)
* ***Other* jobs are those that do not meet the criteria of either good jobs or promising jobs.** Other jobs fail to meet at least one of the criteria of good jobs, meaning they do not provide adequate pay and/or do not provide employer-sponsored health insurance, nor do they offer incumbent workers reliable career pathways to a good job within 10 years. Although other jobs are a vital source of work and income for the people who hold them, their low pay and lack of benefits to better jobs would leave many working families without sufficient resources to meet all their basic needs, and without a viable pathway to a more economically secure future.

We further differentiate good and promising jobs by the typical educational attainment (with and without a four-year college degree) of the people who hold those jobs. For instance, “good jobs held by sub-baccalaureate workers” refers to jobs that are: (a) occupied by individuals who do not hold a four-year college degree; and (b) meet the earnings and benefits criteria noted above. This report focuses on the types of good and promising jobs held by sub-baccalaureate workers, who face shrinking opportunities in many labor markets. However, it also presents data on jobs held by people who have at least a bachelor’s degree, since these workers and the industries in which they are concentrated help support opportunity and prosperity for all people in metropolitan economies.

This analysis estimates the share of jobs that qualify as *good*, *promising*, or *other* jobs in each occupation and “maps” them to industries. Jobs in each occupation are labeled good, promising, or other based on the probability that they meet the criteria for each category given local economic dynamics, jobholders’ demographic characteristics, and their educational attainment. This approach thus estimates what share of jobs in each of more than 800 occupations (defined by the Standard Occupation Classification (SOC) system) fall into each category of job quality.[[8]](#endnote-9) We then tie these occupational job quality metrics to industries (defined by the North American Industrial Classification System (NAICS)) using detailed data on the staffing patterns of each metro area’s industries.[[9]](#endnote-10)

This report presents high-level findings on the opportunity industries and occupations that concentrate good and promising jobs across the nation’s 100 largest metropolitan areas. These findings reveal considerable variation in the share of jobs that qualify as good or promising across occupations, industries, and metropolitan areas. More detailed data and findings on individual metropolitan areas and their industries, occupations, and workers are can be explored and downloaded from a web-based interactive tool. Accompanying case studies of individual metropolitan areas further explore the policies, systems, and institutions that support local opportunity industries and occupations.

# Findings

## Promising career pathways depend on the availability of good jobs

Although we hear a lot about their disappearance due to trade and technology, “good jobs” are important features of nearly all U.S. metropolitan labor markets. By identifying the occupations that concentrate those jobs, as well as those that provide viable pathways to good jobs, local leaders can help more workers without college degrees get a leg up in the labor market.

### Occupations that require specialized skills concentrate good jobs for workers without college degrees

Altogether, the nation’s 100 largest metropolitan areas provided 15.2 million good jobs held by sub-baccalaureate workers in 2017, accounting for 11 percent of all jobs in large metro areas. Another 12.7 million jobs, or 9 percent of all jobs, were promising jobs held by sub-baccalaureate workers.

However, with more than 58 million prime-aged sub-baccalaureate workers, the nation’s large metro areas do not provide nearly enough good and promising jobs for all of them.[[10]](#endnote-11) Only 20 percent of sub-baccalaureate workers currently hold a good job, while another 13 percent hold a promising one. To be sure, not all of these workers could hold good jobs, since the definition of good jobs implies that half of all full-time, year-round sub-baccalaureate workers in the metropolitan area earn less than the threshold. Yet there is scope for increasing that share, as well as the representation of these workers in jobs that facilitate more pathways to higher earnings in the future.

Most good jobs and promising jobs held by sub-baccalaureate workers are concentrated in occupations that themselves contain high shares of good and promising jobs. Yet these good and promising jobs are typically not found in the same occupations.

* **Maintenance, construction, production, and transportation occupations account for a disproportionate share of both good and promising jobs for sub-baccalaureate workers.** These traditionally “blue-collar” occupations together account for 19 percent of jobs in large metro areas, but 44 percent of good jobs and 25 percent of promising jobs held by sub-baccalaureate workers. These occupations also contain among the highest shares of good and promising jobs for these workers. For example, in maintenance occupations, 42 percent of jobs are good jobs held by sub-baccalaureate workers, on average, and another 10 percent are promising. In production occupations, which are found mostly in manufacturing industries, 26 percent of jobs are good and 13 percent are promising for sub-baccalaureate workers. In transportation occupations, which include fork-lift drivers, package and luggage handlers, and truck drivers, 15 percent of jobs are good and 14 percent are promising.
* **Management, business, computer, and engineering occupations also contain a disproportionate share of good jobs held by sub-baccalaureate workers, but provide few promising jobs.** Together, occupations under these major categories account for 16 percent of all jobs in large metro areas, and 25 percent of good jobs held by sub-baccalaureate workers. However, these occupations represent only 5 percent of promising jobs held by sub-baccalaureate workers. In these “white-collar” occupations, large shares of jobs are actually held by sub-baccalaureate workers. Good jobs held by sub-baccalaureate workers represent 24 percent of jobs in engineering and architectural occupations, 20 percent in management occupations, 19 percent in computer and math occupations, and 12 percent in business operations occupations.
* **Likewise, health care practitioner and protective service occupations account for relatively large shares of good jobs held by sub-baccalaureate workers, but few promising ones.** Together these occupations account for 8 percent of jobs in large metro areas, but 14 percent of good jobs held by sub-baccalaureate workers. Like the other skilled professional occupations above, these occupations provide fewer promising jobs. Health practitioner occupations, such as nurses, therapists, and diagnostic technicians, provide significantly more good jobs for sub-baccalaureate workers then health support occupations, such as home health aides and nursing assistants. In protective services occupations, public sector jobs such as police and firefighters are typically good jobs, while private sector jobs such as security guards are typically not.
* **Many of the occupations that provide relatively few good jobs for sub-baccalaureate workers provide many more promising jobs.** Jobs in administrative, sales, and food-service occupations are among the most prevalent in metropolitan America, accounting for more than one out of every three jobs. These occupations provide few good jobs, but higher-than-average shares of promising jobs held by sub-baccalaureate workers. Together, they provide 47 percent of all promising jobs for sub-baccalaureate workers in large metro areas. Similarly, personal care occupations, such as childcare workers, and facilities care occupations, such grounds keepers and janitors, provide almost no good jobs but many promising ones.
* **In some occupations, the bulk of good and promising jobs are held by workers with a four-year college degree.** Large shares of jobs in the social service, education, arts, and science occupations are good or promising for high skill workers. These occupations provide few good or promising jobs for sub-baccalaureate workers. By contrast, although half or more of all positions in management, computer, engineering, and health practitioner occupations are good or promising jobs held by high-skill workers, these fields also meet or exceed the average share of good and promising jobs held by sub-baccalaureate workers.

### People switch careers to get good jobs

Occupations that provide the best chances of obtaining a good job typically require specialized skills. Yet few people follow a specific career pathway to get one. Instead, most people who obtain a good job do so by switching from an unrelated occupation—especially people who do not have a four-year college degree.

Obtaining a good job often requires an occupational switch because good jobs are scarce and highly concentrated in a few types of occupations. Meanwhile, promising jobs are also highly concentrated, but often in different occupations. As a result, most promising career pathways to good jobs are “lattices” that run across occupations rather than “ladders” that exist within them.

* **Workers with less education are more likely to switch careers and depend more on career switching to get a good job.** Across the nation’s largest metro areas, more than 71 percent of workers who are projected to obtain a good job by 2027 will move from one major occupation group to another, representing a significant career switch. This is especially the case for workers without college degrees. Nearly 72 percent of workers with an associate’s degree will switch careers to get a good job, and more than 77 percent of workers with only a high school diploma will switch careers to get a good job.
* **Sub-baccalaureate workers are more likely to switch careers to get a good job in part because more of them start in occupations that provide few good jobs.** Less educated workers are more likely to begin their careers in food service, personal care, facilities care, and health care technician occupations where good jobs are scarce. In fact, more than 90 percent of sub-baccalaureate workers who start in one of these four occupational categories will switch to a different occupational category in order to obtain a good job. Sub-baccalaureate workers who start from occupations that provide more good jobs or require more specialized training or experience, such as health care practitioners, protective service, construction, production, and science and engineering occupations, are far less likely to switch careers in order to obtain a good job.
* **Workers who make the most successful career switches move into jobs that are better paid but entail similar skill sets.** For example, nearly 33 percent of sub-baccalaureate workers who switch out of health care technician occupations switch into good jobs in health care practitioner occupations. About 39 percent of sub-baccalaureate workers who switch out of facilities care occupations switch into construction, maintenance and repair, or production occupations. And sub-baccalaureate workers who switch from jobs in these better-paying occupational categories often switch into good jobs in management, business, or supervisory roles within other occupational categories that entail judgment, decision making, and communication.

\* \* \*

These findings suggest two key implications for how metropolitan leaders across an array of systems and institutions might seek to broaden local labor market opportunity.

First, for most people, the likelihood of obtaining a good job depends significantly on how many good jobs are available in the local economy. Career ladder or apprenticeship models, in which someone starts in a low-paid job and acquires skills and experience over time that allows them to advance to a good job in the same occupation, are rare. Instead, most people gain experience in one occupation and then move to a better job in a different occupation when they find an opportunity to do so.

Second, as people navigate promising career pathways to good jobs, they hold jobs in different occupations that require different sets of knowledge and skills. Navigating these different opportunities likely requires workers to hone the ability to learn new skills and to adapt to different work environments and work styles. Cultivating the abstract cognitive abilities this sort of learning and thinking entails is a hallmark of four-year college degrees, but is not always found in vocational or career and technical education programs today.

## Opportunity industries concentrate good jobs for workers without college degrees

Industries organize work around different sets of occupations and skills. This naturally means that different industries provide different levels of good and promising jobs. *Opportunity industries* are those in which good jobs represent an above-average share of the industry’s total jobs.

By supporting the growth of opportunity industries, especially those that help drive growth in other parts of the economy, leaders in metropolitan areas can increase opportunities for more people and families to reach and maintain their place in the middle class.

### Tradable industries offer among the best chances for sub-baccalaureate workers to obtain good jobs

Regional economists tend to describe metropolitan economies as containing two types of industries. “Tradable” industries are those in which firms export most of their products or services to customers outside the region, and thus compete in national and global markets. These tradable industries—think manufacturing, software, higher education, or freight transportation—constitute the wealth-generating sectors of the local economy. They, in turn, support a set of “local-serving” industries in areas such as retail, food services, and basic health care that cater primarily to customers within the region.

This simple rubric for characterizing metropolitan industries enables a useful first-order look at where good and promising jobs tend to exist within metro economies.

* **The opportunity industries that provide among the highest concentrations of good jobs for people without a four-year college degree are tradable.** Across the nation’s 100 largest metropolitan areas, tradable industries contain only about 30 percent of all jobs but account for 39 percent of the good jobs held by sub-baccalaureate workers.[[11]](#endnote-12) These tradable opportunity industries not only contain many of metropolitan America’s good jobs for sub-baccalaureate workers, but also generate wealth and growth for the entire economy, accounting for nearly 47 percent of metropolitan America’s economic output in 2017.[[12]](#endnote-13)

Tradable industries typically associated with blue-collar jobs, including the manufacturing, logistics, and wholesale trade sectors, provide especially high concentrations of good jobs and near-average shares of promising jobs for sub-baccalaureate workers. In both the logistics sector, which comprises industries involved in the transportation and warehousing of goods, and the manufacturing sector, about 25 percent of jobs are good jobs held by sub-baccalaureate workers—higher than the 11 percent average across all large metropolitan economies. In wholesale trade, 12 percent of jobs are good jobs held by sub-baccalaureate workers.

* **The share of good jobs varies across detailed industries within tradable sectors**. For example, 34 percent of jobs in the primary metal manufacturing industry are good jobs for sub-baccalaureate workers, but the same is true of only 7 percent of jobs in apparel manufacturing. In logistics, 35 percent of long-distance freight trucking jobs are good jobs for sub-baccalaureate workers, versus only 13 percent of jobs in general warehousing or distribution centers. Sectors thus indicate only so much about where real opportunity lies for workers without four-year college degrees.

Other largely blue-collar sectors like utilities or construction are mostly local-serving but contain some tradable industries that are important sources of good jobs. Thirty-five (35) percent of jobs in the utilities sector are in tradable industries, but of those jobs—mostly in electric power generation or transmission—46 percent qualify as good jobs for sub-baccalaureate workers. In the construction sector, only 7 percent of jobs are in tradable industries, including civil infrastructure and industrial facilities construction. Fully 30 percent of jobs in these industries qualify as good jobs for sub-baccalaureate workers.

Tradable industries in sectors typically associated with white-collar jobs also provide above-average shares of good jobs for sub-baccalaureate workers: 16 percent in information (telecommunications, broadcast, and other media industries); 15 percent in corporate headquarters; and 15 percent in professional services industries (engineering, legal, accounting, and consulting services).

* **Although tradable industries concentrate good jobs for sub-baccalaureate workers, they do not concentrate promising jobs**. Good jobs outnumber promising jobs by nearly two-to-one in tradable industries, on average. In tradable industries, people who hold promising jobs can often obtain good jobs without switching industries, by building specific expertise that allows them to climb career ladders. For example, workers who begin as assemblers of engines and other machines move into first-line supervisor roles or roles that involve more advanced techniques and skills in the same industry, such as computer-controlled tool operation.
* **In contrast to tradable industries, industries in local-serving sectors of the economy provide below-average shares of good jobs for people without a four-year college degree**. In the nation’s 100 largest metropolitan areas taken together, local-serving industries account for 63 percent of all jobs but only 57 percent of good jobs held by sub-baccalaureate workers. However, local-serving industries provide many workers with stepping stones to upward mobility, accounting for 71 percent of promising jobs held by sub-baccalaureate workers. Improving job quality and career pathways from these industries can help more people reach good jobs.

Local-serving industries in the hospitality and retail sectors are among metropolitan areas’ largest sources of jobs but provide some of the lowest concentrations of good jobs. In food service industries, which make up the local-serving portion of the hospitality sector, less than 1 percent of jobs are good jobs held by sub-baccalaureate workers. In the retail sector, which is almost entirely local-serving, that share is under 3 percent.

Overall, most jobs in local-serving industries are neither good nor promising. However, there are some local-serving industries that provide exceptional opportunities for sub-baccalaureate workers. Industries in the utilities and construction sectors that primarily serve local consumers offer good jobs for sub-baccalaureate workers at rates well above the economy-wide average. Across the nation’s largest metropolitan areas, 48 percent of jobs in the utilities sector and 31 percent of jobs in the construction sector qualify as good for sub-baccalaureate workers.

* **Local-serving sectors do provide many promising jobs in metropolitan areas**. Although relatively few good jobs for sub-baccalaureate workers exist in local-serving sectors, they tend to provide significant shares of promising jobs. In hospitality and retail, promising jobs held by sub-baccalaureate workers account for 14 percent of all jobs, well above the economy-wide average. In the administrative services sector, which includes industries like temporary hiring agencies, waste management, and facilities management, just 5 percent of jobs are good jobs, but 15 percent are promising jobs. In the local “other services” sector—a catchall that includes auto repair shops, dry cleaners, religious and civic institutions—just 6 percent of jobs are good jobs, but 12 percent are promising jobs. The real estate and arts and entertainment (A&E) industries also contain few good jobs but above-average shares of promising ones.
* **Routes to upward mobility from local-serving sectors often involve switching industries**. Because local-serving sectors tend to comprise a large share of all jobs in the typical metropolitan area, especially for workers without college degrees, they account for many promising jobs. However, because these sectors provide relatively few good jobs, workers who start from promising jobs in local-serving industries typically switch to another industry in order to obtain a good job. Although some people who work in food service industries have promising jobs, most are not likely to become restaurant managers. To get ahead, they are more likely to move to a different industry altogether, becoming truck drivers or customer service representatives.
* **Neither tradable nor local-serving, government is typically a large and rich source of good jobs for sub-baccalaureate workers**. Government accounts for the remaining 7 percent of jobs in metropolitan America not accounted for by tradable or local-serving sectors. Most government jobs in metropolitan areas are in either state or local government. But in government at all levels, an average of 17 percent of jobs are good jobs held by sub-baccalaureate workers, while another 5 percent qualify as promising.

### High-skill workers find good and promising jobs across a range of industries

For workers with bachelor’s degrees, the distinction between tradable and local-serving industries is less sharp with regard to where good and promising jobs exist in most metro areas.

* **A wide range of industries provide relatively high shares of good and promising jobs for workers with at least a bachelor’s degree.** High-skilled workers are required in nearly every industry to one degree or another, whether tradable or local-serving. Across the nation’s 100 largest metropolitan areas, an average of 24 percent of jobs are good or promising jobs held by people with at least a bachelor’s degree (because good and promising jobs are broadly similar for workers with four-year degrees, we combine these categories).
* **Tradable industries in the professional services, information, and headquarters sectors offer the largest shares of good and promising jobs for workers with at least a bachelor’s degree**. In some professional services industries, such as computer systems design, engineering services, and scientific research, 45 percent of jobs are good or promising for high-skill workers. In the information sector, industries such as software publishing, data processing, and broadcasting offer above-average (40 percent) shares of good or promising jobs for college degree holders, similar to corporate headquarters jobs (40 percent).
* **Several local-serving industries also provide opportunities for good jobs and upward mobility for workers with at least a bachelor’s degree.** The healthcare, education, and government sectors are particularly important local-serving sources of good jobs for these workers. The private health care sector, often held up as providing rich opportunity for sub-baccalaureate workers, actually delivers relatively low shares of good or promising jobs for those workers, but many jobs for high-skill workers. Twenty-six (26) percent of jobs in the health care sector, 32 percent in the education sector, and 37 percent in the government sector are good or promising for college-educated workers.

\* \* \*

For economic development leaders, these findings reinforce the importance of tradable industries as drivers of local wealth generation and opportunity. In almost every tradable industry, the share of jobs that qualify as good or promising—for people both with and without a bachelor’s degree—exceeds the economy-wide average. As these industries grow, they can disproportionately increase metropolitan areas’ wealth and opportunity.

For leaders of workforce development and higher education institutions, these findings point to industries where people can find better labor market opportunities. Yet these leaders must also consider the circuitous career pathways many people, especially those without a four-year college degree, follow to good jobs. Not only do few upwardly mobile sub-baccalaureate workers stay in the same occupation over a 10-year period, but also they tend to switch industries as well. By recognizing these “non-linear” pathways to higher earnings, local leaders can develop more effective policies and initiatives that help sub-baccalaureate workers move more quickly toward good jobs.

## Metropolitan areas contain different concentrations of good and promising jobs

This analysis reveals considerable variation across major metropolitan areas, not only in the total share of jobs that qualify as good or promising, but also in the distribution of those jobs by workers’ educational attainment. As a result, each metropolitan area manages to stand out on some dimension of its labor market opportunity, or lack of it.

* **The share of jobs that are good or promising jobs held by sub-baccalaureate workers varies considerably across the nation’s largest metropolitan areas**. Nationwide, 20 percent of jobs in large metro areas are good or promising jobs held by sub-baccalaureate workers. This share varies, however, from a high of 35 percent of jobs in the Spokane, Wash. metro area to a low of just 9 percent of jobs in the Washington, D.C. metro area.
* **The chances that a sub-baccalaureate worker holds a good or promising job also differs considerably across metro areas**. The number of good or promising jobs held by sub-baccalaureate workers varies by place not only because those places have different kinds of occupations and industries, but also because their workers have varying levels of education. Overall, about one in three (34 percent) of sub-baccalaureate workers in the 100 largest metro areas holds a good or promising job. The Spokane, Wash. metro area has enough good and promising jobs for one out of every two sub-baccalaureate workers there, while the Washington, D.C. metro area has enough for only one-in-five sub-baccalaureate workers.
* **The share of jobs that are good or promising jobs held by high-skill workers also varies across metro areas.** High-skill workers have better chances of obtaining good and promising jobs. Nationwide, 23 percent of jobs are good or promising jobs held by high-skill workers who have at least a four-year college degree. Because high-skill workers represent about 33 percent of all workers in large metro areas, these labor markets provide enough good and promising jobs for 70 percent of all high-skill workers. High-skill good and promising jobs represent the largest share of jobs in San Jose (what share of all jobs are they?), and where 75 percent of high-skill workers hold a good or promising job. The Stockton, Calif. metro area provides the lowest share—23 percent—of good and promising jobs for high-skill workers. But because a much lower share of Stockton’s workers have four-year degrees, it still provides enough good and promising jobs for 71 percent of its high-skill workers.

### Industries and wage levels are the primary factors behind local labor market opportunity

Metropolitan areas that have a diverse base of tradable industries, while maintaining overall affordability, provide among the highest shares of good and promising jobs. Metropolitan areas that have only one or neither of these ingredients tend to have a harder time extending broad-based labor market opportunity:

* **The size and diversity of a metro area’s sectors help determine the share of its jobs that are good and promising—and who holds these jobs.** For example, the Youngstown, Ohio and Jackson, Miss. metropolitan areas offer among the highest shares of good and promising jobs for sub-baccalaureate workers. This is primarily because their manufacturing and logistics sectors, which tend to concentrate good and promising jobs, employ especially large shares of these workers. In these metro areas, the share of jobs in opportunity industries, such as primary metal manufacturing in Youngstown or long-distance freight trucking in Jackson, is several times the national average. Similarly, the San Jose and Washington metropolitan areas concentrate opportunity industries that yield good and promising jobs for high-skill workers, such as professional services, corporate headquarters, and government.
* **Within sectors, variation in metro areas’ detailed industries lead to differences in the quantity of good jobs.** For example, across all large metropolitan areas, 24 percent of jobs in the manufacturing sector are good jobs held by sub-baccalaureate workers. In Tucson, Ariz., 45 percent of manufacturing jobs are in transportation equipment manufacturing, which requires advanced skill sets. As a result, 30 percent of Tucson’s manufacturing jobs are good jobs for sub-baccalaureate workers. By contrast, 44 percent of manufacturing jobs in Stockton, Calif. are in lower-skilled food and beverage manufacturing, such that only 16 percent of that region’s manufacturing jobs are good jobs for sub-baccalaureate workers.
* **Even within industries, differing company specializations and skills requirements can translate into regional differences in good jobs.** For example, 70 percent of the workers in Wichita’s transportation equipment manufacturing industry, which is focused mostly on aerospace manufacturing, have some post-secondary education or credential. However, only 51 percent of workers in Memphis’s transportation equipment manufacturing industry, which is focused mostly on automotive parts, have some post-secondary education.[[13]](#endnote-14) As a result, Wichita’s transportation equipment manufacturing industry workers are better compensated, and 67 percent of the jobs in this industry qualify as good jobs, versus 46 percent in Memphis.
* **Metro areas with higher typical earnings for sub-baccalaureate workers tend to exhibit smaller overall shares of good jobs for those workers.** For example, median earnings for sub-baccalaureate workers in Jackson, Miss. are $32,400, but in Houston they are $38,900. As a result, only 19 percent of jobs in Houston’s general freight trucking industry qualify as good jobs for sub-baccalaureate workers, versus 50 percent in Jackson. In metro areas with higher sub-baccalaureate earnings, part-time and seasonal jobs are less likely to qualify as good jobs, even if they pay high hourly wages.
* **The share of a metro area’s jobs that are *promising* depends on these same factors that determine the share of good jobs as well as the overall dynamism of the economy.** As noted above, the availability of good jobs directly determines the share of jobs in a metropolitan area that are promising. Though industries in some sectors of the economy provide internal career ladders that permit workers to gain specific knowledge and experience, most upwardly mobile workers instead switch between occupations and industries based on the availability of better paying jobs in other parts of the local economy. The share of jobs in a metropolitan area that provide promising pathways to good jobs also depends on the metropolitan area’s growth rate and affordability, however. For example, the combination faster growth and lower wage thresholds in many Sunbelt metro areas creates more opportunities for incumbent workers and their lower wage thresholds help them reach good jobs faster.

\* \* \*

No large U.S. metropolitan area provides sufficient high-quality labor market opportunities for all the people who need them, especially workers without a bachelor’s degree. Even in Spokane, with the highest share of good and promising jobs for sub-baccalaureate workers, only half of its sub-baccalaureate hold one. Metro areas can begin to close these gaps by addressing factors that influence local labor market opportunity, such as industrial composition, workforce characteristics, wage levels, and growth dynamics.

# Conclusion

This report reinforces the challenges facing leaders throughout metropolitan America in expanding labor market opportunity, especially for individuals without a four-year college degree. Yet it also points to potential solutions.

Nearly all metropolitan areas do not provide enough good and promising jobs for sub-baccalaureate workers. Furthermore, those jobs are highly concentrated in industries such as construction and manufacturing that have grown slowly in recent years, and are not likely to account for much greater proportions of jobs going forward. In fact, as technological change continues to reshape work, some good jobs in these industries and others, including logistics, may disappear.

Yet the report also finds reasons for optimism. For one, some fast-growing industries and occupations typically associated with higher-skill work, such as computer, engineering, and information technology jobs, in fact contain many good jobs for sub-baccalaureate workers.

More importantly, this report finds considerable dynamism in local labor markets. Many people switch occupations and industries from one year to the next. This dynamism is crucial to communities’ adjustment to a changing economy. In a series of recent studies on automation, McKinsey Global Institute found that as many as one in four U.S. workers will need to switch occupations by 2030 as their current one disappears.[[14]](#endnote-15) As it turns out, many more workers will switch occupations naturally as they seek better opportunities.

The challenge for leaders in metropolitan America is harnessing this dynamism in ways that enable workers’ mobility to better jobs and the middle class. Although there is no doubt arming people with the knowledge and skills required by the jobs of the future is essential, most people cannot find opportunity where none exists. Metropolitan economies must provide the good jobs people need to move ahead.

To that end, leaders should seek to grow more good jobs in opportunity industries, improve job quality in industries where it is low, and prepare people for a more dynamic economy. These strategies implicate a number of systems and institutions in metropolitan areas.

* **First, economic developers can prioritize opportunity industries that concentrate good jobs.** Too often, scarce public resources are spent on incentivizing on job growth or retention in industries that provide too little opportunity. Though job growth is important, economic development is more effective when the job growth it spurs increases the share of good jobs in the local economy. Such jobs not only broaden access to opportunity, but industries that concentrate good jobs also tend to have a greater economic impact. Economic development can also involve more than incentives. Existing institutions and customized services can create shared knowledge and resources that can enhance the growth and competitiveness of local firms, especially the more footloose firms in tradable industries that disproportionately contain good jobs.[[15]](#endnote-16)
* **Second, leaders in the private and public sectors can work together to improve job quality.** In most metropolitan areas, job growth alone is unlikely to close the gap between the number of good jobs and the number of people who need them. Improving the quality of the existing job base is not only essential for workers, but can also help employers. A growing body of research shows that improving job quality—by treating labor as an asset rather than a cost—is good for the bottom line in some sectors that provide many “other” jobs, including retail, hospitality, health care, and education.[[16]](#endnote-17) Improving job quality doesn’t just mean increasing wages and benefits. Improving the visibility of pathways from low-quality jobs to better ones can also increase opportunity.
* **Third, education and workforce development institutions can prepare people for and connect them to today’s more demanding and dynamic labor market.** The content of work changes rapidly today, even within occupations. New technologies constantly emerge, requiring continuous training and adaption. Meanwhile, workers may need to switch careers more often to stay ahead of change or access opportunity. These dynamics stress the growing importance of abstract cognitive abilities that enable people to think and learn by themselves. Specific knowledge and skills remain essential to getting a job, but keeping that job or finding a better one may require workers and institutions to adopt new modes of learning and teaching to succeed in today’s labor market.

These efforts to expand labor market opportunity, while not a panacea, can help more of today’s working families thrive and invest in their own future and that of their community. Ultimately, creating an economy that provides greater opportunity for more people and families requires leaders across multiple systems to share an understanding of the challenges and pursue a coordinated strategy to address them. By assessing the effects of shifting local labor market demand on the local workforce, this report and its accompanying web-based interactive provide new information to help inform such efforts, charting the industries and occupations that may provide the best chances for individuals in each metro area to obtain a good, middle-class job.

# References

Bartik, Timothy J. "Who Benefits from Economic Development Incentives? How Incentive Effects on Local Incomes and the Income Distribution Vary with Different Assumptions about Incentive Policy and the Local Economy." Upjohn Institute Technical Report No. 18-034. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2018

Bollinger, Christopher and Barry Hirsch. “Match Bias from Earnings Imputation in the Current Population Survey: the Case of Imperfect Matching.” Journal of Labor Economics, 24(3): 483-519, 2006.

Delgado, Mercedes, Michael Porter, and Scott Stern. “Defining Clusters of Related Industries.” National Bureau of Economic Research Working Paper No. 20375. 2014.

Madrian, Brigitte and Lars John Lefgren. “A Note on Longitudinally Matching Current Population Survey (CPS) Respondents.” National Bureau of Economic Research Working Paper No. T0247. 1999.

Manyika, James, Michael Chui, Mehdi Miremadi, Jacques Bughin, Katy George, Paul Willmott, and Martin Dewhurst. “Harnessing automation for a future that works.” McKinsey and Company, 2017.

Manyika, James, Susan Lund, Michael Chui, Jacques Bughin, Jonathan Woetzel, Parul Batra, Ryan Ko, and Saurabh Sanghavi. “Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation.” McKinsey and Company, 2017.

Moscarini, Guiseppe and Kaj Thomsson. “Occupational and Job Mobility in the US.” Scandinavian Journal of Economics, 109(4): 807–836. 2007.

Rivera Drew, Julia, Sarah Flood, and John Robert Warren. “Making Full Use of the Longitudinal Design of the Current Population Survey: Methods for Linking Records across 16 Months.” Journal of Economic and Social Measurement, 39(3): 121–144. 2014.

Ruggles, Steven, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. Integrated Public Use Microdata Series: Version 7.0 American Community Survey 1-year data, 2006 to 2016. Minneapolis, MN: University of Minnesota, 2017.

Shearer, Chad, Amy Liu, Natalie Holmes, and John Ng. “Opportunity Clusters: Identifying pathways to good jobs in metro New Orleans.” Brookings. 2015.

# Technical appendix

This report has two major research objectives. The first is to identify the industries in each local labor market that disproportionately contain or “concentrate” good jobs that will persist despite ongoing change in the world of work. The second objective is to identify the means by which local labor markets permit people to move from jobs that are not good to ones that are.

These objectives lead to a four major research tasks:

* Defining a “good job” and identifying jobs that meet its criteria in each metropolitan area
* Projecting future labor market demand for good jobs in each metropolitan area
* Locating good jobs with durable demand within industries in each metropolitan area
* Revealing all possible career pathways from “other jobs” to good jobs and the likelihood of each one in each metropolitan area

These tasks present number of technical challenges since there are few ready sources of data that meet the project’s needs. The final task of modeling career pathways presents a series of challenges since there are not only scant data on labor market transitions or career pathways to inform the analysis but also few agreed upon methods of performing it.

These research objectives and limitations motivated a series of creative solutions. These solutions were originally developed by the authors of a 2015 Brookings study of labor market opportunity in metro New Orleans. The authors of the present report have updated and improved on the data and methods from this prior report to produce the analysis presented above.

#### Data sources and procedures

##### The Current Population Survey

A major challenge for any study of the labor force or of labor flows, such as job or occupational transitions, is finding appropriate data. People can make work transitions quickly and frequently. Detecting all of them requires frequent and detailed observation.[[17]](#endnote-18) Though some European counties have rich administrative data that track labor movements, in the U.S. researchers typically must rely on household surveys. However, longitudinal surveys are cumbersome, for both subjects and interviewers, especially at the short intervals required. As a result, most longitudinal surveys are small, making it difficult to extract robust insights, especially if one is interested in variations across time and space.

The Current Population Survey (CPS) manages to overcome most of the challenges of studying labor flows and boasts several advantages over alternative sources. The CPS is a household survey run jointly by the U.S. Bureau of Labor Statistics and the U.S. Census Bureau. It is one of the nation’s largest and longest running surveys. The monthly version of the survey covers roughly 60,000 occupied households—meaning dwelling units—and is nationally representative.[[18]](#endnote-19) It has served as the nation’s source of the monthly unemployment rate since 1948.

The CPS has a unique longitudinal design and detailed questionnaire that makes it particularly well suited for labor flows analysis. A household rotates into the survey for four consecutive months, then out of the survey for eight months, and then returns to the survey for another four consecutive months before leaving the sample permanently.[[19]](#endnote-20) In the initial month of each four-month rotation, respondents are asked about their employment status, including their employer, industry, and occupation. In subsequent months, respondents are asked a series of questions about what, if anything, about their employment status has changed. This makes it possible to confidently identify changes in respondents’ labor market status, such as a different employer or occupation from the prior month.

The size, frequency, detail, and quality controls of the CPS yield advantages over alternative sources of data on occupational transitions. The CPS surveys enough households that it is representative of the population and workforce at the national and state levels. The survey’s monthly frequency over four consecutive months reduces survey attrition and makes it possible to detect most labor market transitions. The survey also queries demographic and educational characteristics of respondents, making it possible to distinguish labor market behaviors among different population groups. Finally, the design of the questionnaire and back-end quality control enable high confidence in such identifications.

Alternative sources provide few of these advantages. Longer-range longitudinal surveys like the National Longitudinal Survey of Youth are too small and infrequent to robustly identify all of their subjects’ labor market transitions. Resume data are an exciting potential source of career data in the future but so far researchers have not been able to fully overcome resumes’ inherent selection bias, in terms of population and content, and unstructured nature. And no other longitudinal source provides as comprehensive and representative information about labor force characteristics and trends.

However, the CPS is also imperfect, though, and therefore requires some careful cleaning to make it maximally useful and representative. Despite its longitudinal design and detailed information about the work status of respondents, the CPS was not originally intended as a longitudinal source. It therefore requires procedures that help us take advantage of this design. Further, like all surveys, the CPS must deal with survey attrition and non-response—problems that have become worse for almost all household surveys and polls in recent years. In cases of non-response to a question or inconsistent answers, CPS interviewers and data coders strive for completeness rather than accuracy, which can introduce error for studies like this one.

First, monthly records of CPS respondents must be matched across months. To do this, we follow the procedures developed by Madrian and Lefgren of using administrative record numbers.[[20]](#endnote-21) For some years, we use supplemental procedures proposed by researchers at the Minnesota Population Center.[[21]](#endnote-22) Matching on record numbers using these procedures yields naïve matches that are then confirmed using sex, race, age, and education, again following these earlier studies.[[22]](#endnote-23) Records that do not survive these procedures for month-to-month matching are disqualified and dropped from the analysis. These non-matching records are more common for some population groups. In order to avoid introducing bias from dropping the unmatched records, we follow an inverse weighting procedure similar to the one proposed by Bollinger and Hirsch.[[23]](#endnote-24) In this procedure, the longitudinal survey weight of each match respondent is inflated in proportion to the likelihood of that respondent not matching in that month.

In the final month of a dwelling unit’s two four-month survey rotations, employed occupants are interviewed about their hours and earnings. Observations for dwellings and occupants in the final month of these rotations, called the Outgoing Rotation Groups (ORG), form the basis for identifying the typical hours worked and earnings per hour for workers in different occupations and industries.

##### American Community Survey

Although the CPS does provide information survey subjects’ health insurance coverage, the authors’ instead used the American Community Survey (ACS) for these data. Panel data like those needed to identify occupational transitions were not necessary for identifying workers who receive employer-sponsored health insurance. As a cross-sectional survey, the ACS is able to provide a much larger sample that is more representative of sub-state patterns. The ACS is used again in later steps of the analysis for similar reasons.

##### Job openings

Data on job openings provide a basis for predicting the likelihood of an occupational transition and, relatedly, for extend the applicability of the nationally representative CPS data on occupational mobility to sub-state areas. Unfortunately, data on monthly occupational job openings for sub-state areas are not readily available. Instead, the authors assimilated data and projections from a number of data sources and methods.

There are three sources of job openings. First, a job opening is created when a business decides to hire for a position that did not previously exist. This is the job growth source. Second, a job opening is created when an incumbent worker moves to a different job or occupation. This is the turnover source. Third, a job opening is created when an incumbent worker permanently leaves the labor force, for example, to begin retirement. This is the labor force exit source.

Data for the job growth source were generated by transforming county-level annual occupational employment data from Economic Modeling Specialists, Inc., a private data provider, into a monthly series and then subtracting the previous month’s number of jobs from the current months. These data were then projected out to 2027 using Moody’s Analytics industry job growth projections and BLS Occupational Employment Projections.

Data for job openings from the other two sources were generated from the authors’ analysis of the CPS data described above. Following methods developed by BLS researchers, the authors developed statistical models of CPS data to derive the probabilities that incumbent workers would leave their occupation or exit the labor force. The CPS data were pooled over different time periods to provide average rates of turnover and exiting by month. These probabilities were also projected into the future.

The authors then summed these estimates of monthly occupational job openings across these sources at the national level and compared them to data on national rates of job openings provided through the BLS’s Job Openings and Labor Turnover Survey (JOLTS). The authors’ estimates closely matched the estimates provided by JOLTS. As there is no source for sub-state occupational job openings, the authors are unable to validate their estimates for those areas.

#### Analytic methods

##### Modeling local career pathways from data on occupational mobility

With the data described above in hand, the authors then began a three-step process of modeling career pathways for workers within the metropolitan area.

1. ***Estimating the probability of switching between two given occupations***

The authors used regression analysis to estimate the probability that an incumbent worker would switch from his or her present occupation to another. This was done for each pair of transitions observed in the CPS data on occupation mobility. In each regression, the universe was any respondent who reported working in the origin occupation in the prior month. The dependent variable indicated whether the respondent worked in the destination occupation in question during the current month. The authors used logistic regressions that condition the probability of switching between the two occupations on the destination occupation’s share of job openings in the vicinity of the respondent in the current month and the respondent’s personal characteristics, including age in years, sex, race, and level of education.

In the authors view, this is the best approach to estimating the probability of occupational switching given the task at hand: using national data to develop localized estimates of the probability of occupational switching. For this purpose, the authors were not concerned with explanatory power or statistical significance. Instead, the concern was predictive power. Somewhat surprisingly, most of the successful regressions have reasonable explanatory power. Based on the authors’ review of literature, most also have better predictive power than regressions conditioned on occupational similarity. However, models for some pairs of occupations had too few observations to produce valid results. These models were omitted from further steps.

1. ***Constructing occupational transition matrices***

The results of these regressions were then applied against data on the metropolitan area’s workforce characteristics and projected future job openings in order to derive monthly persona-specific occupational transition matrices. In these matrices, each cell contains the probability that a person meeting the characteristics of that persona would switch from a given origin occupation (the row) to a given destination occupation (the column) at a given month in the future in the metropolitan area.

This process began by defining a universe of personas. Each persona is defined by the personal characteristics included in the occupational transition regressions. There is one persona for every combination of age, sex, race, and education included in the regressions, resulting in many thousands of personas. For example, one persona represents a 35-year-old black non-Hispanic male with a bachelor’s degree. Another represents a 50-year-old Hispanic female with some college experience. The authors calculate a person weight for each row each persona’s matrix using data from the ACS to represent the number of workers that belong to each persona that report working in the origin occupation in the metropolitan area.

Using the successful occupational transition regressions from above, the authors determined the probability that a persona will transition between a given pair of occupations given the personal characteristics it represents and a destination occupation’s projected share of job openings in a given future month in the metro area. For pairs of occupational transitions where regressions were unsuccessful, the authors simply assigned the observed rate of transitions from the CPS data rather than a probability estimated from a regression. For pairs of occupations where no transitions can be observed from the CPS data, a transition probability of zero was assigned. Finally, the probability of not transitioning from a given occupation to another (contained in the cells on the matrix’s diagonal) was set equal to one minus the sum of the other cells in the row.

This process was done for every persona and for every month from 2017 to 2027, resulting in several hundred thousand matrices, each conveying transition probabilities for every pair of more than 500 occupations that describe every job in the metropolitan area. Each matrix conveys the likelihoods that a person fitting the characteristics of that persona will switch between any two occupations in a given month in the metropolitan area, and each persona’s matrix is weighted by the currently number of actual workers who fit the persona’s definition in the metropolitan area.

1. ***Estimating occupational transitions in career pathways***

Finally, to estimate the cumulative conditional probability of that a worker represented in a persona who begins in any one occupation at the end of 2016 will end up in any other by the end of 2027, these monthly persona-specific matrices are multiplied against each other in what is known as a Markov Chain. This begins by multiplying the matrix for January, 2017 against the matrix for February, 2017. The matrix product of this multiplication indicates the probability that a worker starting in a given occupation in December, 2016 will transition to any other occupation come February, 2017. This matrix product is then multiplied against the matrix for the month of March, 2017, whose product is multiplied against the matrix for April, 2017, and so on until December, 2027.

The final matrix product that results from this process, and the person weight assigned to the original matrices, as described above, forms the basis for this report’s analysis of local career pathways.

This approach cannot perfectly describe career pathways. It rests on an assumption that a worker’s probability of transitioning into another occupation depends only on the worker’s occupation in the prior month (along with the variables factored into the regressions, of course). Actually, transitions likely also depend on the worker’s tenure in his or her occupation, and may also depend on the worker’s prior occupations or job. Basically, this approach cannot capture the importance of a person’s resume in predicting his or her future occupational transitions. However, such information is at least partially factored into the analysis given that the real workers and transitions represented in the underlying CPS data were in fact able to obtain those jobs and make those transitions. This approach seems reasonable in the absence of data that truly represent actual careers.

##### Modeling earnings and benefits

In the final phase of this analysis, hours, wages, and benefits were estimated for all starting and ending occupations for each persona. Estimates for each these measures were derived from regression analyses of the CPS ORG data or ACS data described above. Each of these regressions are premised on the Mincerian earnings function, a model developed by economist Jacob Mincer that labor economists commonly use to explain wages. In Mincer’s model, education and work experience explain wages.

The regressions used in the present set of analyses build from Mincer’s relatively simple model. Age is substituted as a proxy for work experience. Additionally, regressions for each measure include variables indicating sex, race, and sector of employment since labor market outcomes like wages are known to vary along these lines, even for workers in the same occupation. For the wage and benefit regressions, full- or part-time status is also used as an explanatory variable. For the benefit regressions, state fixed effects are included. (Benefit regressions only include data from years after the implementation of the Affordable Care Act). All regressions were carried out for each occupation.

Estimating each measure involved a different model specification. To estimate hours, the authors used an ordered logistic regression. To estimate probability of receiving employ-sponsored health care insurance—a proxy for other employment benefits—the authors used a logistic regression. To estimate hourly wage, the authors used a generalized linear model where the wage is modeled as its logarithm. Additionally, the authors estimated workers’ exempt or non-exempt status to determine their overtime eligibility. This logistic regression excluded demographic factors besides age and included state fixed effects.

##### Estimating job quality by industry

The results of all of these estimates—occupational transitions, hours worked, wages earned, overtime eligibility, and benefits—were evaluated together to determine whether the average worker in a given persona, given current occupation, and given future occupation has a good, promising, or other job.

#### Areas for future research and refinement

# Acknowledgments

The Brookings Institution is a nonprofit organization devoted to independent research and policy solutions. Its mission is to conduct high-quality, independent research and, based on that research, to provide innovative, practical recommendations for policymakers and the public. The conclusions and recommendations of any Brookings publication are solely those of its author(s), and do not reflect the views of the Institution, its management, or its other scholars.

The Metropolitan Policy Program at Brookings would like to thank both the Surdna Foundation and State Farm for their generous support of this analysis, and the Metropolitan Council, a network of business, civic, and philanthropic leaders that provides both financial and intellectual support for the Program.

Brookings is committed to quality, independence, and impact in all of its work. Activities supported by its donors reflect this commitment.

This research would not have been possible without input and advice from researchers and practitioners throughout the country.

At Brookings, the authors are grateful for the incredible patience and stewardship of Amy Liu and Alan Berube. The authors are indebted to Natalie Holmes and John Ng, who were coauthors of an earlier Brookings report on Metro New Orleans for which many of the methods that undergird this analysis were first developed. Special thanks go to Marek Gootman, Mark Muro, Elizabeth Patterson, and Carolyn Gatz for their contributions to accompanying case studies that informed the presentation of findings in this report. The authors acknowledge the excellent research assistance of Elena Casanovas, Kyle Finnegan, Jonathan Guy, Kanny Morgan, and Samuel Peterson.

Early applications and presentations of this research in Metro New Orleans, Central Indiana, California’s Inland Empire, Northeast Ohio, Greater Phoenix, and Metro Atlanta helped sharpen the assumptions, methods, and presentation of this analysis. The authors are grateful for the valuable thought partnership of leaders in these communities, including Allison Plyer, David Johnson, Betsy McCaw, Jason Kloth, Elizabeth Lerch, Nathan Ringham, Karthick Ramakrishnan, Lou Monville, Brad Whitehead, Peter Truog, Bethia Burke, the staff of the Greater Phoenix Economic Council, and the staff of the Metro Atlanta Chamber of Commerce.

Finally, the work of the Brookings Metro communications team was invaluable in producing the report and toward its outreach. Thanks to Julia Kraeger, David Lanham, Alec Friedhoff, Rachel Barker, Anthony Fiano, Carly P. Anderson for their assistance with various aspects of the production of this report. Special thanks go to Alec Friedhoff for interactive data visualization production and to Luisa Zottis for report layout and design.

# Notes

1. Chad Shearer and others, “Metro Monitor 2018,” Brookings, 2018. [↑](#endnote-ref-2)
2. Timothy J. Bartik, “What Proportion of Children Stay in the Same Location as Adults, and How Does This Vary Across Location and Groups?” Upjohn Institute for Employment Research, 2009. <https://research.upjohn.org/up_workingpapers/145/>. [↑](#endnote-ref-3)
3. Wage and salary jobs represent over 90 percent of employment nationwide and at least 85 percent of employment in every large metropolitan area. These shares have remained stable in recent years. Not only are wage and salary jobs the most dominant and enduring form of employment, but they also tend to provide more stable employment and income compared to contract and contingent work. [↑](#endnote-ref-4)
4. Median earnings thresholds for each metropolitan area were determined from 2012–2016 1-year American Community Survey (ACS) microdata collected from the Minnesota Population Center’s Integrated Public-Use Microdata Series (IPUMS). Dollar-denominated fields were deflated prior to analysis. [↑](#endnote-ref-5)
5. In many metropolitan areas, this earnings threshold is roughly equivalent to the income a typical working-age adult would need to meet their family’s basic needs according to detailed county-based cost-of-living estimates. [↑](#endnote-ref-6)
6. Authors’ analysis of 2012–2016 1-year ACS microdata collected from IPUMS. [↑](#endnote-ref-7)
7. These anticipated trends take into account recent regional growth patterns, macroeconomic projections, and modest estimates of labor automation. A description of the underlying data and methods of analysis is available in the technical appendix. [↑](#endnote-ref-8)
8. U.S. Bureau of Labor Statistics, “2010 Standard Occupational Classification System,” 2010. See: <https://www.bls.gov/soc/> [↑](#endnote-ref-9)
9. U.S. Office of Management and Budget, “2012 North American Industry Classification System,” 2012. See: <https://www.census.gov/eos/www/naics/> [↑](#endnote-ref-10)
10. This analysis includes workers aged 18 to 57 years who have at least 12 years of education. Data on the number, share, and likelihood of holding jobs of different quality come from the authors’ analysis of 2012-2016 ACS 1-year data collected from IPUMS. [↑](#endnote-ref-11)
11. For tradable industry definitions, see: Delgado, Mercedes, Michael Porter, and Scott Stern. “Defining Clusters of Related Industries.” National Bureau of Economic Research Working Paper No. 20375. 2014. [↑](#endnote-ref-12)
12. Emsi estimates. [↑](#endnote-ref-13)
13. Authors’ analysis of 2012-2016 American Community Survey 5-year microdata. [↑](#endnote-ref-14)
14. James Manyika and others, “Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation,” McKinsey Global Institute, 2017. [↑](#endnote-ref-15)
15. Timothy J. Bartik, “Who Benefits from Economic Development Incentives? How Incentive Effects on Local Incomes and the Income Distribution Vary with Different Assumptions about Incentive Policy and the Local Economy." Upjohn Institute Technical Report No. 18-034. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2018. [↑](#endnote-ref-16)
16. François Carré and Chris Tilly, “Where Bad Jobs are Better: Retail Jobs Across Countries and Companies” (Russell Sage Foundation, 2017); Zeynep Ton, “The Good Jobs Strategy: How the Smartest Companies Invest in Employees to Lower Costs and Boost Profits” (Houghton Mifflin Harcourt, 2014); Nancy Martin, “Advancing the Anchor Mission of Healthcare,” Healthcare Anchor Network(coordinated by The Democracy Collaborative), 2017; Rush University Medical Center, “Anchor Mission Playbook,” The Democracy Collaborative*,* 2017. [↑](#endnote-ref-17)
17. Guiseppe Moscarini and Kaj Thomsson, “Occupational and Job Mobility in the US,” Scandinavian Journal of Economics, 109(4), 2007. [↑](#endnote-ref-18)
18. U.S. department of Labor and U.S. Department of Commerce. “Current Population Survey Design and Methodology.” Technical Paper 66. 2006. [↑](#endnote-ref-19)
19. Ibid. [↑](#endnote-ref-20)
20. Brigette Madrian and John Lars Lefgren, “A Note on Longitudinally Matching Current Population Survey (CPS) Respondents,” NBER, 1999. [↑](#endnote-ref-21)
21. Julia Rivera Drew, Sarah Flood, and John Robert Warren, “Making Full Use of the Longitudinal Design of the Current Population Survey: Methods for Linking Records Across 16 Months,” Journal of Economic and Social Measurement, 2014. [↑](#endnote-ref-22)
22. We find that education is effectively treated as an immutable characteristic for the purposes of the CPS’s two four-month survey rotations: respondents are only asked about it at the beginning of each rotation so it therefore should not change from month to month. We therefore disqualify naively matched records where education does not match. [↑](#endnote-ref-23)
23. Christopher Bollinger and Barry Hirsch, “Match Bias from Earnings Imputation in the Current Population Survey: the Case of Imperfect Matching,” Journal of Labor Economics, 24(3), 2006. [↑](#endnote-ref-24)