

A Moment of Opportunity: The COVID-Era Job Market for Noncollege Workers¹

Keith Wardrip² | January 2022



Key Findings

- Both unemployment and job openings were substantially higher in mid-2021 than they were before the COVID-19 pandemic, but because the increases were proportionally similar, the number of unemployed persons per job opening in June 2021 was roughly equivalent to the level in February 2020.
- As measured by the number of unemployed persons per job opening, the labor market was modestly tighter for noncollege workers (i.e., workers without a bachelor's degree) in June 2021 than in February 2020. The reverse was true for those with at least a bachelor's degree.
- The minimum educational requirements requested by employers in online job postings fell modestly after the onset of the pandemic, even after controlling for the postings' broad occupation and sector classifications.
- The share of online job postings meeting the criteria for opportunity employment — postings for jobs paying decent wages and accessible to noncollege workers — rose notably during the pandemic to 28 percent at the end of 2020 before drifting back to 26 percent in the second quarter of 2021. This represented an increase of more than 700,000 job postings and a 3-percentage-point premium relative to the first quarter of 2020.
- Compared with the five quarters preceding the pandemic, the five quarters following its onset included an additional 2.3 million opportunity employment job postings. These additional postings can be attributed to both the greater volume of job postings for the occupations in question (62 percent of the increase) and lower educational requirements (38 percent of the increase).

¹ The views expressed in this report are solely those of the author and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

² I would like to express my gratitude to Joe Budash, Kyle DeMaria, Deborah Diamond, Kyle Fee, Shigeru Fujita, Brad Hershbein, Lisa Nelson, Davin Reed, and Bryan Stuart for their comments on an earlier draft of this report.

Background

Since the onset of the COVID-19 pandemic in March 2020, the U.S. labor market has been, in a word, turbulent. Unemployment quadrupled between February and April 2020 and, despite a significant economic rebound, remained substantially higher in the first half of 2021 than before the pandemic.³ A vast body of recent research clearly shows that lower-wage workers, workers with lower levels of formal education, women, workers of color, and both younger and older workers were disproportionately affected by these job losses.⁴ Even though unemployment remained elevated, the economy counterintuitively showed signs that the demand for labor exceeded the supply. The number of job openings climbed to an all-time high in June 2021,⁵ and employers were increasingly offering hiring incentives, lowering requirements, or providing training to fill open positions.⁶ Relative to February 2020, wage growth for lower-wage workers outpaced growth for those earning higher wages,⁷ while for those without a college degree, the average “reservation wage” — the lowest wage a worker would accept for a new job

— reached new heights.⁸ By June 2021, the number of unemployed persons per job opening (0.9) had returned to a level roughly equivalent to levels seen during the strong economic years of 2018 and 2019,⁹ even though both underlying metrics (unemployment and job openings) were substantially higher than in the recent past.

Furthermore, there is evidence to suggest that prior recessionary periods have represented a time of accelerated labor market polarization through the permanent loss of routine, middle-skills jobs or through their transformation to higher-skilled occupations by way of increased capital investment.¹⁰ As such, there is reason to wonder whether the specific jobs lost during the pandemic will return and whether those created during and after the economic recovery will require different skills — a concern bolstered by research indicating that occupations vulnerable to automation were hit particularly hard during the early months of the pandemic.¹¹ Research also suggests that employers, as a whole, act rationally when filling open positions by lowering educational requirements in tight labor markets and raising them when job seekers are abundant.¹² These phenomena have the potential to affect employment opportunities in real and measurable ways for workers without a bachelor’s degree (hereafter referred to as noncollege workers).

³ Author’s analysis of U.S. Bureau of Labor Statistics Current Population Survey data, seasonally adjusted.

⁴ Michael Dalton, et al. “The K-Shaped Recovery: Examining the Diverging Fortunes of Workers in the Recovery from the COVID-19 Pandemic using Business and Household Survey Microdata,” BLS Working Paper 536, July 2021; Guido Matias Cortes and Eliza C. Forsythe. “The Heterogeneous Labor Market Impacts of the COVID-19 Pandemic,” Upjohn Institute Working Paper 20-327, May 2020; Tomaz Cajner, et al. “The U.S. Labor Market During the Beginning of the Pandemic Recession,” National Bureau of Economic Research Working Paper No. 27159, May 2020; Gopi Shah Goda, et al. “The Impact of COVID-19 on Older Workers’ Employment and Social Security Spillovers,” National Bureau of Economic Research Working Paper No. 29083, July 2021; Didem Tuzemen. “Women Without a College Degree, Especially Minority Mothers, Face a Steeper Road to Recovery,” *Economic Review* 106(3): pp. 5–23, August 2021; Opportunity Insights Economic Tracker.

⁵ U.S. Bureau of Labor Statistics. “Job Openings and Labor Turnover – June 2021,” Job Openings and Labor Turnover Survey News Release. U.S. Bureau of Labor Statistics, August 9, 2021.

⁶ AnnElizabeth Konkel. “Employer Use of Hiring Incentives Grows,” Indeed Hiring Lab, June 24, 2021; Catherine Rampell. “The Great Reallocation of American Talent,” *The Washington Post*, June 24, 2021; Anne D’Innocenzio. “Companies Loosen Job Requirements but Challenges Remain,” AP News, September 3, 2021.

⁷ Mitchell Barnes, Lauren Bauer, and Wendy Edelberg. *11 Facts on the Economic Recovery from the COVID-19 Pandemic*, Washington, DC: The Hamilton Project at the Brookings Institution, September 2021.

⁸ New York Fed Survey of Consumer Expectations – Labor Market Survey Module, July 2021. More information is available at www.newyorkfed.org/microeconomics/sce/labor/#/.

⁹ U.S. Bureau of Labor Statistics. “Number of Unemployed Persons Per Job Opening, Seasonally Adjusted,” news release, August 9, 2021.

¹⁰ Nir Jaimovich and Henry E. Siu. “Job Polarization and Jobless Recoveries,” *Review of Economics and Statistics* 102(1): pp. 129–47, March 2020; Brad Hershbein and Lisa B. Kahn. “Do Recessions Accelerate Routine-Biased Technological Change? Evidence from Vacancy Postings,” *American Economic Review* 108(7): pp. 1737–72, 2018.

¹¹ Lei Ding and Julieth Saenz Molina. “‘Forced Automation’ by COVID-19? Early Trends from Current Population Survey Data,” Community Development and Regional Outreach Discussion Paper, Federal Reserve Bank of Philadelphia, September 2020.

¹² Alicia Sasser Modestino, Daniel Shoag, and Joshua Ballance. “Upskilling: Do Employers Demand Greater Skill When Workers are Plentiful?” *Review of Economics and Statistics* 102(4): pp. 793–805, October 2020; Alicia Sasser Modestino, Daniel Shoag, and Joshua Ballance. “Downskilling: Changes in Employer Skill Requirements Over the Business Cycle,” *Labour Economics* 41: pp. 333–47, 2016; Kyle Fee, Keith Wardrip, and Lisa Nelson. *Opportunity Occupations Revisited: Exploring Employment for Sub-Baccalaureate Workers Across Metro Areas and Over Time*, Cleveland: Federal Reserve Banks of Cleveland and Philadelphia, 2019.

Research Questions

In this report, I combine several national data sets to assess how the turbulence in the labor market sparked by the COVID-19 pandemic affected employment prospects for noncollege workers and job seekers — both relative to their college-educated counterparts and relative to the period preceding the pandemic. I do not seek to measure the net change in noncollege jobs over the course of the pandemic but to describe the magnitude and nature of employment opportunities available to noncollege job seekers hoping to participate in the recovery. To do so, I use 15 months of data following the onset of the COVID-19 pandemic (hereafter referred to as the COVID era) to answer the following three questions:

- 1. After the onset of the pandemic, how did demand for noncollege and college-educated labor change relative to the supply of unemployed workers?**
- 2. Controlling for broad occupation and sector classifications, did employers' educational requirements for new hires change in the COVID-era labor market?**
- 3. How did the historically high number of job postings and shifting educational requirements interact to affect economic opportunity for noncollege job seekers?**

This is not the first paper to analyze labor market tightness and employers' changing educational requirements during the pandemic.¹³ What sets this report apart, however, is that after empirically exploring these important issues using data through mid-2021, I incorporate information on wages to investigate how rising demand and shifting educational requirements intersect to alter the availability of well-paying opportunities for noncollege job seekers.

¹³ Of particular relevance to this report is an analysis of labor market tightness by educational attainment and shifting employer educational requirements by Eliza Forsythe, et. al. "Searching, Recalls, and Tightness: An Interim Report on the COVID Labor Market," National Bureau of Economic Research Working Paper No. 28083, December 2020.

Supply and Demand by Educational Attainment

Between February and April 2020, the number of persons considered unemployed in this analysis of Current Population Survey (CPS) data¹⁴ rose by roughly 23.8 million: 17.7 million did not have a bachelor's degree, while 6.0 million held a bachelor's degree or higher.¹⁵ Relative to February 2020, this represented a larger proportional increase for workers with at least a bachelor's degree than for noncollege workers — a pattern that held for much of the COVID era (**Figure 1A**). Overall, unemployment in June 2021 remained roughly 63 percent higher than in February 2020 (an index value of 163 in **Figure 1A**). Ignoring the cyclical summer uptick of unemployed individuals with a bachelor's degree evident at the end of the study period, the relative change in unemployment had nearly converged for these two groups.

In order to understand the educational requirements of job openings dating back to 2018, I analyze data from two national sources: Burning Glass Technologies and the BLS's Job Openings and Labor Turnover Survey (JOLTS). For the 16 broad sectors used to classify job openings in the JOLTS data set, I use Burning Glass data¹⁶ to calculate both the monthly share of online job postings requiring a bachelor's degree or higher and the share requiring less education (hereafter referred to as the noncollege share). Specifically, JOLTS data capture the total number of job openings on the last business day in a given month, while Burning Glass data indicate the level of education sought by employers in job advertisements posted online in the

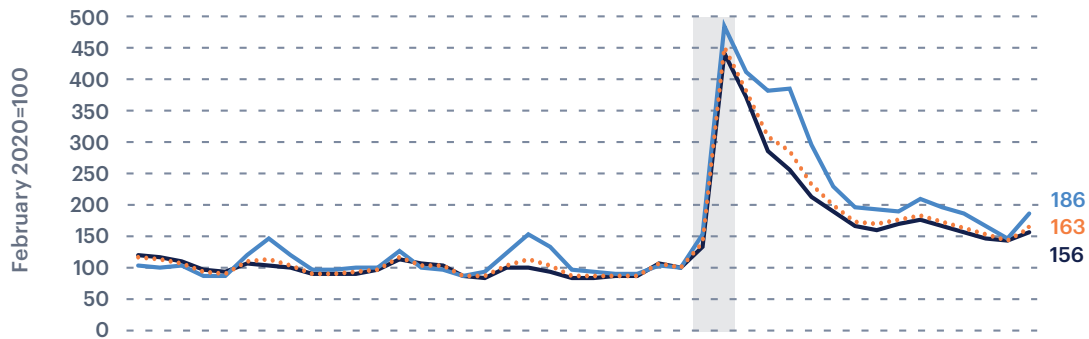
¹⁴ More information on the Current Population Survey can be found at www.bls.gov/cps/home.htm.

¹⁵ Author's analysis of CPS basic monthly samples retrieved from IPUMS CPS, University of Minnesota, www.ipums.org. The official measure of unemployment includes both those without a job who are actively searching for work and those on temporary layoff who have an expectation of being recalled. The latter group of workers increased substantially during the early months of the COVID-era period but declined to more normal, if slightly elevated, levels by the end of the study period. See Robert E. Hall and Marianna Kudlyak. "The Unemployed with Jobs and Without Jobs," Federal Reserve Bank of San Francisco Working Paper 2021-17, July 2021, and Forsythe et al. (2020). In addition to those classified in the CPS as unemployed, I include workers considered to be employed but absent from work for "other reasons." See the notes for Figure 1 for more information.

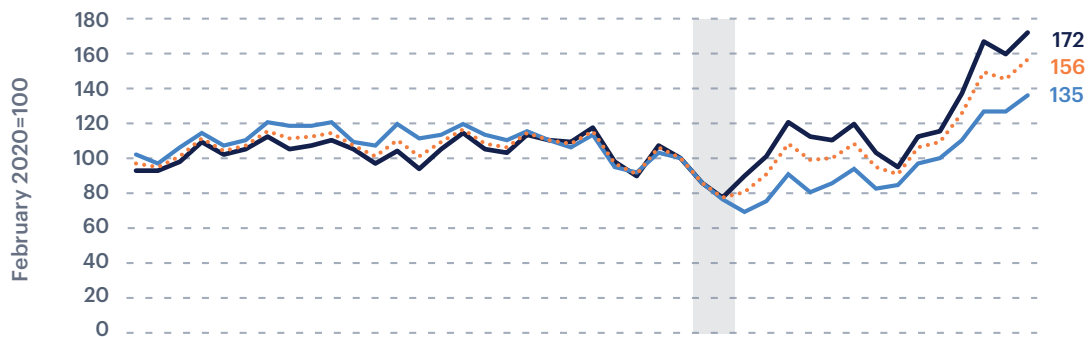
¹⁶ More information on Burning Glass Technologies data can be found at www.burning-glass.com/.

Figure 1: Unemployment and Job Openings by Educational Attainment

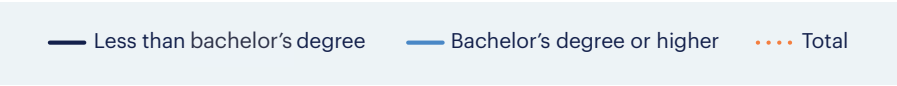
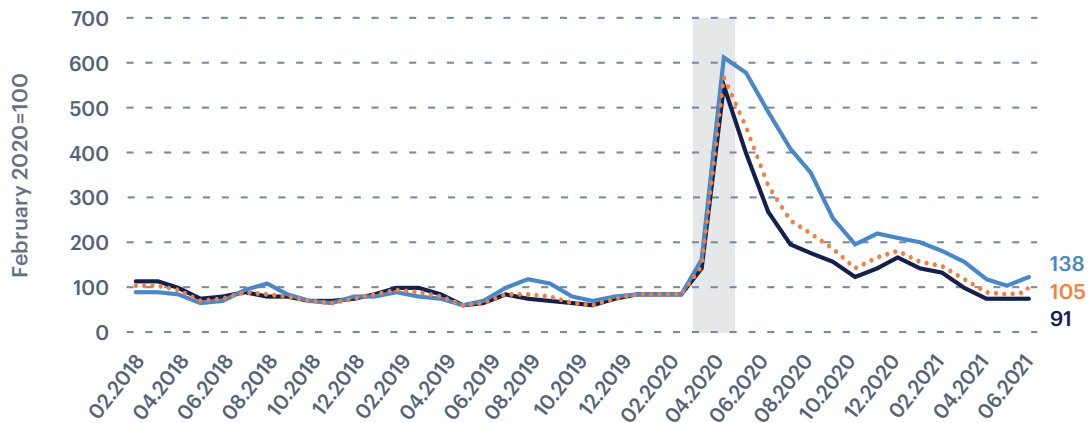
A: Unemployed Persons



B: Job Openings



C: Unemployed Persons Per Job Opening



Notes: Gray shading indicates recession. Estimates are not seasonally adjusted. Unemployment estimates are calculated using CPS composite weights. Unemployed persons include the civilian noninstitutional population age 16 years and over classified in the CPS as unemployed, as well as those counted as employed but absent from work for “other reasons,” in light of the misclassification of CPS respondents particularly apparent during the early months of the pandemic. For more information on the misclassification issue, see www.bls.gov/covid19/effects-of-covid-19-pandemic-and-response-on-the-employment-situation-news-release.htm. The monthly noncollege share for each sector reported in JOLTS is calculated from Burning Glass Technologies job postings data and used to classify job openings by the level of education required. Throughout this report, job postings with no occupation code, internships, and those from employers in U.S. territories are excluded.

Sources: Author’s analysis of January 2018–June 2021 data from CPS basic monthly samples retrieved from IPUMS CPS, University of Minnesota, www.ipums.org; the U.S. Bureau of Labor Statistics Job Openings and Labor Turnover Survey; and Burning Glass Technologies

same month. Merging these data sets provides a rough monthly series of changes in overall labor demand and the demand for workers with different levels of education.¹⁷

After falling dramatically in the spring of 2020, job openings staged a modest rebound in the second half of the year (Figure 1B). From January to June 2021, total job openings exceeded the level reported in February 2020, but there was a stark divergence in trends by educational attainment that is consistent with prior analyses: Relative to pre-COVID levels, demand in the COVID-era labor market favored workers with lower levels of formal education.¹⁸ This likely reflected employers rehiring for lower-wage positions that were lost after the onset of the pandemic as well as the difficulty employers faced filling these positions, but it may also have reflected a hesitancy to create and fill higher-wage openings, which can be a relatively more costly and time-consuming process, in the face of continued economic uncertainty.¹⁹

By June 2021, the labor market had nearly rebounded to February 2020 levels in terms of the number of unemployed persons per job opening (an index value of 105 in Figure 1C). It bears repeating that while this relationship had returned to pre-COVID levels, both the number of unemployed persons and the number of job openings were substantially higher than immediately before the pandemic. Driven by both the proportionally greater increase in unemployment and the relatively

softer rebound in openings, there was more slack in the market for college-educated job seekers in June 2021 than there had been in February 2020 (an index value of 138). While the actual number of unemployed persons per job opening remained higher for noncollege workers than for their college-educated counterparts — at 1.3 and 0.7, respectively — the market for noncollege workers in June 2021 was modestly tighter than in February 2020 (an index value of 91).²⁰

The measure of unemployment illustrated in Figure 1 does not include those who reported not looking for work because of the COVID-19 pandemic, as these individuals were considered to be out of the labor force. There were nearly 10 million such individuals in May 2020 (the first month this question was asked in the CPS) but fewer than 2 million in June 2021.²¹ Including these individuals would have done little to the relationships or patterns shown in Figure 1, but it would have suggested additional slack in the labor market across the board. I exclude these individuals from Figure 1 because they were not seeking employment when they were surveyed, but their return from the labor market's sidelines could alleviate some employers' job-filling difficulties.

Shifting Educational Requirements

As mentioned previously, the strong rebound in job openings for noncollege workers must, to some extent, reflect the need to refill lower-wage positions that were shed during the spring of 2020. However, because employers have been shown to adjust educational requirements for openings in response to economic conditions, the faster rebound in noncollege openings could also be partly explained by the content of the postings themselves. Employers needing to fill positions quickly in a reopening economy could have conceivably lowered their requirements to attract prospective workers,

¹⁷ More information on the BLS's JOLTS data set can be found at www.bls.gov/jlt/. While the application of a noncollege share based on a sector's job postings in a given month (i.e., the flow) is not perfectly compatible with the sector's aggregate number of job openings (i.e., the stock) because some openings were likely advertised in the prior month(s), the median month-to-month difference in the noncollege share within sectors is a minimal 1.5 percentage points. Because a sector's noncollege share does not generally change substantially from month to month and because the average time to fill a job opening has been estimated at slightly longer than one month, applying the noncollege share for job postings in a given month to a sector's stock of job openings does not appear to be problematic. Support for the average time-to-fill estimate using data through 2017 can be found in Cole Dreier, Shigeru Fujita, and Ryotaro Tashiro. *What Can Employers Do to Mitigate Hiring Difficulties? Evidence from Online Job Ads*, Philadelphia: Federal Reserve Bank of Philadelphia, February 2020, and in the DHI-DHF Vacancy Duration Measure available at www.dice.com/indicators/.

¹⁸ Forsythe et al. (2020); Murillo Campello, Gaurav Kankanhalli, and Pradeep Muthukrishnan. "Corporate Hiring Under COVID-19: Labor Market Concentration, Downskilling, and Income Inequality," National Bureau of Economic Research Working Paper No. 27208, May 2020; Opportunity Insights Economic Tracker.

¹⁹ Jed Kolko. "Coronavirus and US Job Postings Through October 16: Data from Indeed.com," Indeed Hiring Lab, October 21, 2020.

²⁰ The finding of a loosening in the labor market for college-educated workers relative to noncollege workers echoes results presented in Forsythe et al. (2020) through November 2020. Unemployment data through September 2021 and job openings data through August 2021 indicate that the labor market continued to tighten in the third quarter, overall and for both noncollege and college-educated workers. The index values reported in Figure 1C for August 2021 would have been between 9 and 13 points lower than those reported for June.

²¹ Author's analysis of CPS basic monthly samples retrieved from IPUMS CPS, University of Minnesota, www.ipums.org.

given that ongoing health concerns, childcare challenges, the presence of a financial cushion, and extended unemployment benefits were keeping some candidates out of the labor market.²²

To explore this possibility, I calculate the mean years of education requested in online job postings for which a minimum education is included (e.g., 12 years for a high school diploma or 16 years for a bachelor’s degree) and compare quarterly averages with Q1 2018 (Figure 2).²³ In the quarters immediately preceding the pandemic, the mean years of education requested in the overall online job market had been on a modest

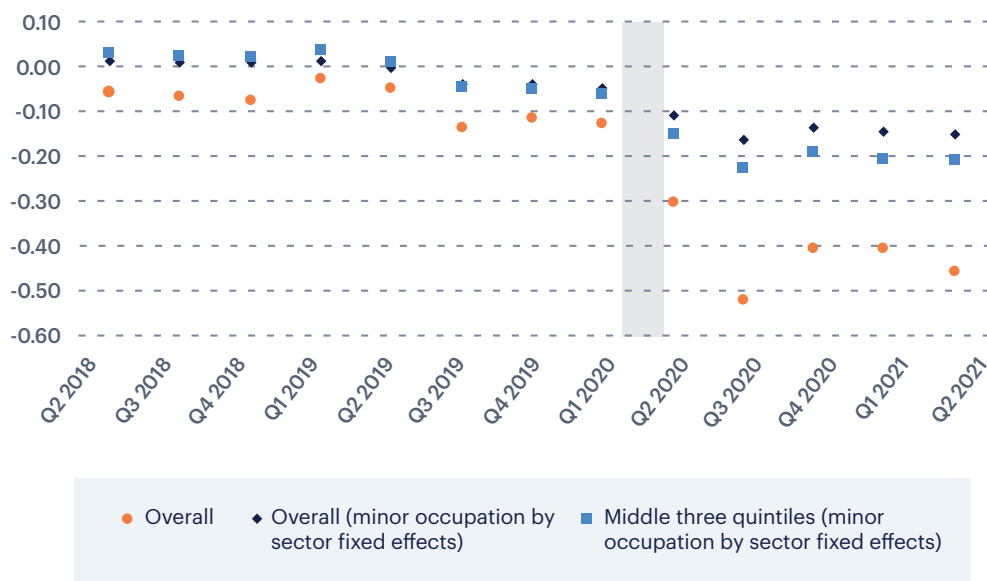
downward trajectory. At the onset of the pandemic, however, this value dropped noticeably and was roughly 0.4 to 0.5 year below Q1 2018 levels in the last four quarters of the study period (orange dots). This pattern is consistent with Figure 1B, which illustrates a COVID-era labor market favoring openings requiring less education.

In order to determine whether lower mean educational requirements were purely a function of the types of jobs being advertised or whether, for the same types of jobs, employers lowered their educational requirements, I also calculate the mean years of education for roughly 2,000 combinations of 94 minor occupational groups by 21 sectors (including a sizable group for which the industry of the job posting is unknown). As Figure 2 suggests, the downward trajectory in mean years of education persists, albeit to a lesser degree, even after controls for occupation and sector are included (dark blue

²² Nick Bunker. “Indeed Job Search Survey June 2021: COVID Concerns and Financial Cushions Make Job Search Less Urgent,” Indeed Hiring Lab, June 29, 2021; Stacie Haller. *What’s Stopping Unemployed Americans from Job Hunting?* San Francisco: Resume Builder, August 19, 2021.

²³ In any given year during the study period, between 46 and 48 percent of job postings do not include a minimum educational requirement. These job postings are ignored in the calculation of mean years of education.

Figure 2: Change in Mean Years of Minimum Education Required in Job Postings (Relative to Q1 2018)



Notes: Gray shading indicates recession. Mean years of minimum education reflect the average number of years of education associated with the minimum credential included in the job postings for a given occupation-sector. It is calculated for roughly 2,000 combinations of 94 minor occupational groups (as identified by the first three digits of their 2010 Standard Occupational Classification, or SOC, code) by 21 sectors (as identified by the first two digits of the North American Industry Classification System, or NAICS, code, including a group for which the industry of the job posting is unknown). Mean values ignore job postings with no minimum education but are weighted by the total number of job postings for the occupation-sector (including those with no minimum education). The series representing the middle three quintiles captures the occupations that, on a job postings–weighted basis, constitute the middle of the distribution of mean education in Q1 2018, ranging from 12.5 to 15.6 years. The graphed differences between each quarter and Q1 2018 have a p value below 0.001 in all cases.

Source: Author’s analysis of data from Burning Glass Technologies (January 2018–June 2021)

diamonds).²⁴ Excluding the 20 percent of occupations requiring the most education and the 20 percent requiring the least in order to focus on the middle three quintiles for which educational preferences might be most fluid, the mean education requested in online job postings during the COVID era was roughly 0.2 year below levels seen in early 2018 (light blue squares).²⁵ For this subset of occupations specifically and focusing only on job postings listing an educational requirement, the share of ads requesting a bachelor's degree fell by 4 percentage points between Q1 2020 and Q2 2021, while the share requesting a high school diploma rose by 6 percentage points (results not shown).

There are two competing explanations for why educational requirements were, on average, modestly lower in the COVID-era labor market than they were before the onset of the pandemic. The first is that even within these broad occupation and sector classifications, narrower occupations requiring less education were more likely to shed jobs during the recession, and employers were simply refilling those positions as the economy rebounded. (Taken a step further, it is even possible that for largely identical jobs, workers with less education were disproportionately laid off, and the job postings for replacement workers reflected the lower level of education needed for the position.) A second possible explanation is that some employers lowered their educational requirements in order to fill open positions more quickly in a labor market facing headwinds.²⁶ Although discerning the

precise explanation is beyond the scope of this analysis, the finding that minimum educational requirements were lower in the COVID-era labor market than in the preceding period raises the question: How did economic opportunity shift for noncollege job seekers following the onset of the pandemic?

Implications for Economic Opportunity

In order to assess the extent to which the surge in job postings and shifting educational requirements affected economic opportunity for noncollege workers in the COVID-era labor market, wages must be brought into the discussion. In this section, I build on the concept of *opportunity employment*, a term defined in prior research as employment accessible to a worker without a bachelor's degree and generally paying above the national annual median wage.²⁷ By linearly interpolating between the select percentile wages provided for each occupation in the BLS's 2018 Occupational Employment and Wage Statistics (OEWS) data set,²⁸ I am able to calculate the share of each occupation's jobs that pays above the national annual median wage of \$36,660. From January 2018 through June 2021, I also calculate each occupation's monthly share of online job postings requiring a bachelor's degree or higher and, conversely, the share accessible to noncollege workers (i.e., the noncollege share). With this information for each occupation, the vast majority of the 123 million job postings during this period can be classified into one of three categories: opportunity employment postings, higher-wage postings requiring a bachelor's degree, and lower-wage postings.

In classifying an occupation's job postings into one of these three categories, I assume that postings requiring a bachelor's degree or higher are more likely to pay higher wages than postings requiring less education. As such, a portion of an occupation's postings can be classified as opportunity employment only if the occupation's share paying higher wages exceeds the share requiring a bachelor's degree. For

²⁴ Prior research has shown that, even for the same occupation, employers' educational requirements vary geographically (Fee, Wardrip, and Nelson 2019) and that job postings requiring a bachelor's degree can also require more advanced skills than job postings that do not (Burning Glass Technologies. *Moving the Goalposts: How Demand for a Bachelor's Degree Is Reshaping the Workforce*, Boston: Burning Glass Technologies, 2014). This analysis does not control for the geographic location of the job postings or their requested skills.

²⁵ In results not shown, estimates of quarterly differences in the mean years of minimum education, controlling for over 800 detailed occupations but not sector, produce very similar results as the series controlling for minor occupational groups by sector illustrated in Figure 2.

²⁶ Relative to the pre-COVID labor market, Forsythe et. al. (2020) also observe between March 2020 and November 2020 a decreasing likelihood that a job posting will require a bachelor's degree and, consistent with the results presented here, find that much of this decline can be explained by a change in the composition of job postings toward occupations requiring less education. However, they still find that for job postings within the same occupation, and for jobs posted within the same occupation by the same firm, postings were modestly less likely to request a bachelor's degree during this period than before the pandemic.

²⁷ For the latest national report exploring opportunity employment, see Fee, Wardrip, and Nelson (2019).

²⁸ I use the OEWS research data set referred to as MB3 because of its apparent advantages over the official OEWS data set. More information on MB3 estimates is available at www.bls.gov/oes/oes-mb3-methods.htm.

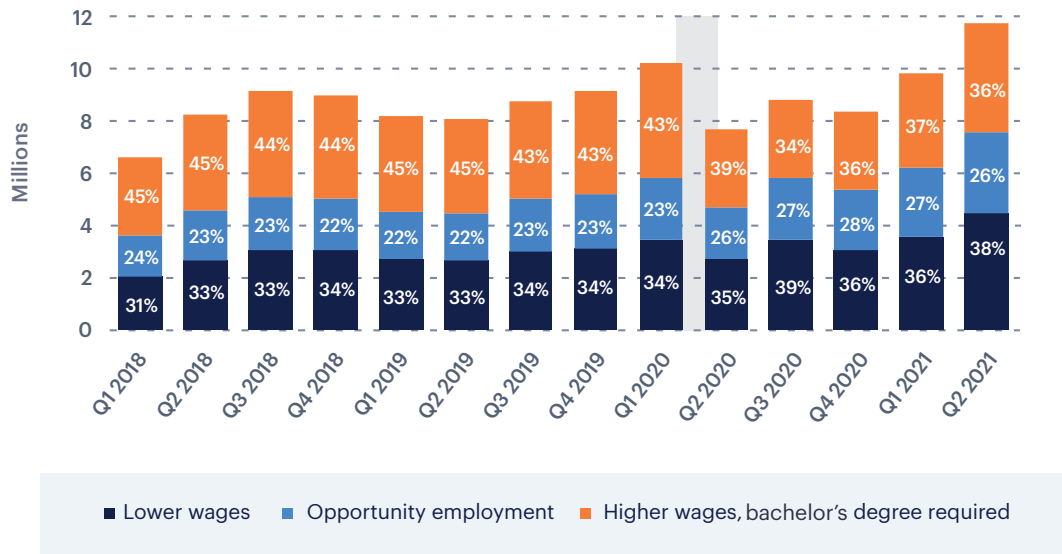
example, if 50 percent of an occupation’s jobs are estimated to pay above the national annual median wage and 40 percent of its job postings in a given month require a bachelor’s degree, then 40 percent are classified as higher-wage postings requiring a bachelor’s degree, 10 percent are classified as opportunity employment postings, and 50 percent are classified as lower-wage postings.²⁹

Between the first quarter of 2018 and the second quarter of 2021, both the size and the characteristics of the online job market changed dramatically

²⁹ Using this methodology, roughly 1 percent of all job postings are classified as requiring a bachelor’s degree but paying lower wages. This occurs in the rare instances in which the share of postings requiring a bachelor’s degree exceeds the share of jobs paying above the national annual median wage (e.g., childcare workers, retail salespersons). Rather than creating a fourth category to capture these postings, they are simply classified as lower-wage postings in this analysis.

(Figure 3). As was the case for cumulative job openings illustrated in Figure 1B, quarterly job postings exhibited strong growth during the first half of 2021, reaching roughly 11.7 million in Q2 2021 after averaging only 8.3 million each quarter in 2018 and 2019. Before the pandemic, there was relative stability in the distribution of postings across the three categories, but beginning in the second quarter of 2020 and corresponding with the onset of the pandemic, the online job market shifted noticeably. Between Q1 2020 and Q2 2021, the share of postings classified as higher wage and requiring a bachelor’s degree fell markedly, while the share classified as lower-wage postings rose 4 percentage points. The share of opportunity employment postings rose notably to 28 percent at the end of 2020 before drifting back to 26 percent in Q2 2021. In this last quarter of the study period, opportunity employment

Figure 3: Quarterly Job Postings by Wages and Educational Requirements



Notes: Gray shading indicates recession. The OEWS data set provides 10th, 25th, 50th, 75th, and 90th percentile wages, between which I interpolate the intervening percentile wages. For occupations paid on an hourly rather than on an annual basis, I use the median weekly hours worked, as estimated from 2013–2017 American Community Survey microdata, and assume year-round employment to calculate an annual wage for each percentile. This process allows me to estimate the share of each occupation’s employment that paid above the national annual median wage in 2018; this share is held constant throughout the study period. For the vast majority of occupations, accounting for nearly 97 percent of job postings, a minimum education level is included in at least 25 job postings for each month during the study period, and the monthly noncollege share is applied to all job postings (including those with no minimum education). For occupations accounting for 3 percent of job postings, the noncollege share is recoded to zero because, according to the BLS’s 2018–2028 Employment Projections data set, they typically require a doctoral or professional degree for entry. For less than 1 percent of job postings, an occupation’s noncollege share over the full study period is used because fewer than 25 job postings in a given month include a minimum education level. A negligible share of job postings is excluded because the occupation lacks 25 job postings with a minimum education over the full study period or because OEWS wage estimates are missing. Values are calculated by month to preserve temporal granularity but reported here by quarter.

Sources: Author’s analysis of data from Burning Glass Technologies (January 2018–June 2021), BLS Occupational Employment and Wage Statistics MB3 estimates (May 2018), BLS Employment Projections table 5.4 (2018–2028), and the American Community Survey Five-Year Public Use Microdata Sample (2013–2017)

postings exceeded Q1 2020 levels by more than 700,000 and increased their share of the online job market by 3 percentage points.

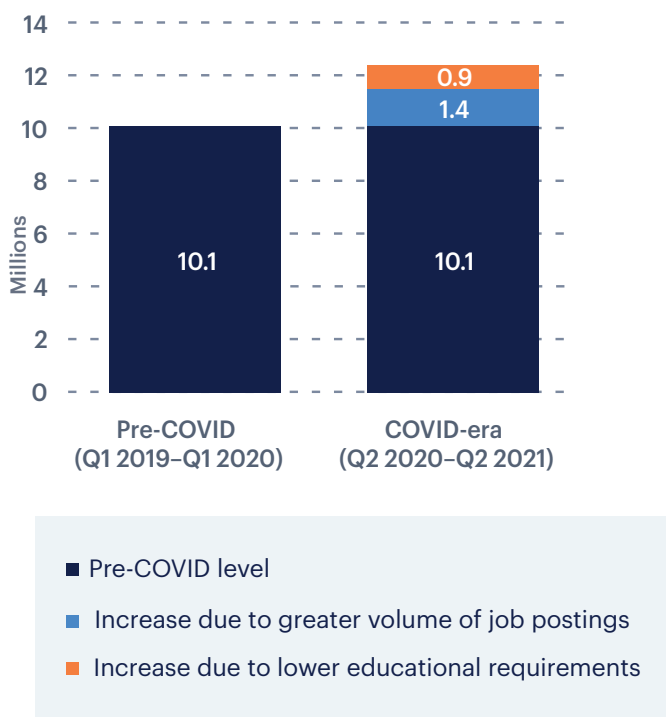
Owing to the greater volume of job postings and their modestly lower educational requirements, opportunity employment postings were more numerous in the COVID-era labor market than they were before the pandemic. In the five quarters following the onset of the pandemic, the number of job postings classified as opportunity employment increased by 2.3 million relative to the preceding five quarters (Figure 4). Using a decomposition technique, it is possible to isolate the effect that changes in the noncollege share and changes in the total number of job postings had on an occupation’s net change in opportunity employment job postings between these two periods. This analysis suggests that both factors — the greater

volume of job postings (1.4 million, or 62 percent of the increase) and the lower level of educational requirements (0.9 million, or 38 percent of the increase) — played important roles.³⁰

As noted earlier in the discussion of job openings, an unknowable portion of the growth in job postings for opportunity employment surely reflects hiring to replace workers laid off during the recession. If, within narrowly defined occupations, workers with lower levels of education were more likely to lose their jobs during the downturn than their more highly educated counterparts, this replacement hiring could have affected not only the volume of job postings but also the modestly lower levels of education requested therein. Further, it is even possible that the urgency to fill open positions led some employers who traditionally did not post their openings online to do so after the recession, which also could explain some of the increased volume. All of these phenomena may have contributed to the outcome described in Figure 4: an online job market richer in opportunity for noncollege workers after the pandemic than before its onset.

Roughly half of the 1.4 million increase in opportunity employment postings attributed to a greater volume of job postings were associated with two occupations: truck drivers and registered nurses (Figure 5A). While employers uniformly agree that truck drivers do not need a bachelor’s degree, opportunity employment

Figure 4: Change in Opportunity Employment Postings



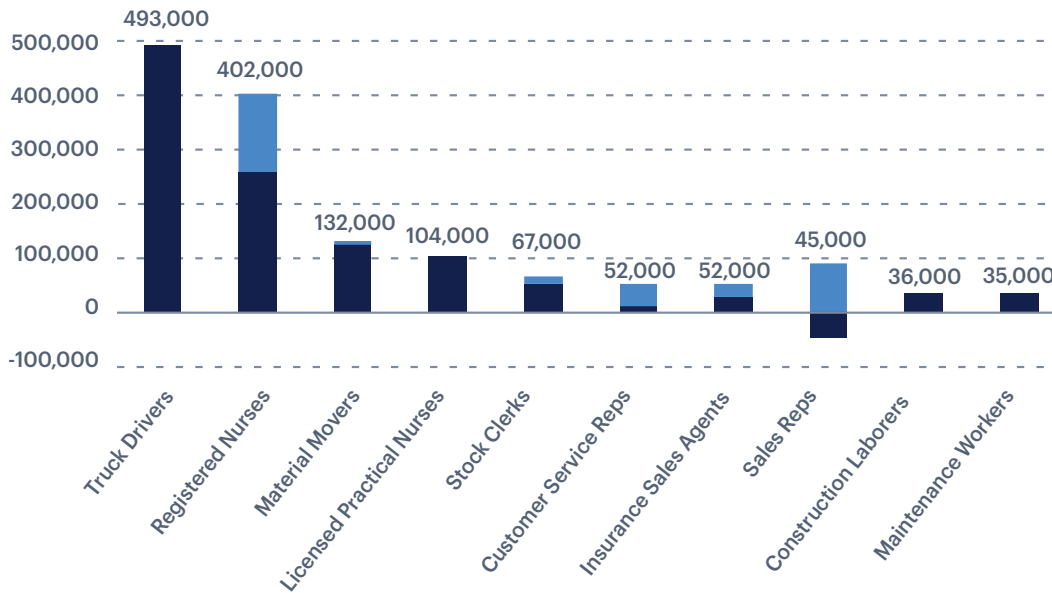
³⁰ I use a method known as the Shapley decomposition to tease out the net effects of the change in the volume of job postings and the change in the noncollege share on opportunity employment postings between the pre-COVID and COVID-era quarters. In short, the method isolates how changes to an input (e.g., the difference in an occupation’s pre-COVID and COVID-era noncollege share) affect the outcome in question (e.g., the difference in an occupation’s pre-COVID and COVID-era opportunity employment postings). The calculated effects for the volume of job postings and the noncollege share perfectly explain the net change in an occupation’s opportunity employment postings between these two periods, with no residual. More on the Shapley decomposition can be found in Anthony F. Shorrocks, “Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value,” *Journal of Economic Inequality* 11(1): pp. 99–126, 2013.

Notes: The numbers of opportunity employment postings shown here are consistent with the quarterly totals shown in Figure 3, with one exception to the underlying calculation: For occupations with fewer than 25 job postings listing a minimum education in a given month, the relevant noncollege share for the five-quarter period (rather than the full study period) is used instead. Occupations with fewer than 25 job postings listing a minimum education in either period are excluded from this analysis.

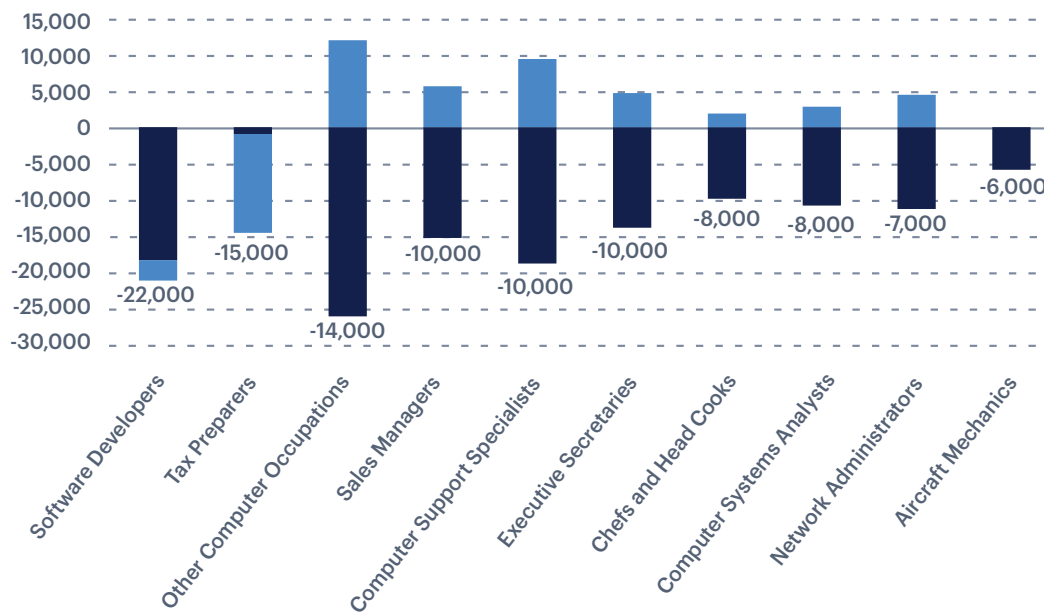
Sources: Author’s analysis of data from Burning Glass Technologies (January 2019–June 2021), BLS Occupational Employment and Wage Statistics MB3 estimates (May 2018), BLS Employment Projections table 5.4 (2018–2028), and the American Community Survey Five-Year Public Use Microdata Sample (2013–2017)

Figure 5: Occupations with the Greatest Change in Opportunity Employment Postings (Five Pre-COVID Quarters vs. Five COVID-Era Quarters)

A: Largest Increase



B: Largest Decrease



■ Change due to volume of job postings ■ Change due to educational requirements

Notes: Pre-COVID quarters span January 2019–March 2020. COVID-era quarters span April 2020–June 2021. Chart labels reflect the net change in the number of opportunity employment job postings over these two periods. Occupational titles were shortened for the figure but should be intuitive except for Sales Reps in Figure 5A; the full title is Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products.

Sources: Author’s analysis of data from Burning Glass Technologies (January 2019–June 2021), BLS Occupational Employment and Wage Statistics MB3 estimates (May 2018), BLS Employment Projections table 5.4 (2018–2028), and the American Community Survey Five-Year Public Use Microdata Sample (2013–2017)

postings also rose for registered nurses because educational requirements were lower after the onset of the pandemic than before it. Growth for several white-collar occupations in sales and customer service was primarily or partly attributable to loosening educational requirements, while other occupations that have historically not required a bachelor's degree, such as licensed practical nurses and construction laborers, saw opportunity employment postings increase purely as a function of market demand.

COVID-era opportunity employment postings fell relative to pre-COVID quarters in some cases, although declines were relatively modest (Figure 5B). With a few exceptions, the occupations experiencing the greatest decline were white collar in nature, and for all but tax preparers, the decline was primarily a function of aggregate demand. For seven of the 10 occupations shown in Figure 5B, changes in employers' educational requirements expanded opportunity for noncollege workers but not by enough to offset the decline in volume.

Concluding Thoughts

The recession induced by the COVID-19 pandemic wreaked havoc on the labor market, and prior research indicates unequivocally that lower-wage and noncollege workers bore the brunt of the recession. This analysis focuses on employer demand in the five quarters following the onset of the pandemic, and as such, it captures the economic snap back. It is unsurprising, then, that the recovery through June 2021 was characterized by a strong rebound in openings for the same types of jobs lost during the recession: lower-wage jobs and jobs requiring lower levels of formal education. The overall relationship between the supply of and demand for labor had

nearly returned to pre-COVID levels by June 2021, while the market for jobs requiring lower levels of formal education looked marginally tighter than in the recent past. Admittedly, local conditions for specific occupations may look quite different than the national snapshot presented in this report.

An explanation for the finding of modestly lower average educational requirements in the COVID-era online job market is beyond the scope of this analysis, but this shift does not appear to be driven entirely by the types of occupations in high demand. Whether this finding is simply a manifestation of employers refilling previously lost positions with similarly educated workers, one of several employer responses to fill openings more quickly during the economic recovery, or a reflection of a growing public and private sector push — sometimes motivated by equity and diversity concerns — to hire for skills rather than degrees,³¹ the effect is clear: During this period, looser educational requirements created a substantial amount of additional opportunity in the COVID-era online job market for noncollege job seekers. Successfully matching skilled workers with these openings could be a springboard to economic mobility for these workers and their families³² and a precursor to a stronger and more equitable recovery.

³¹ Executive Office of the President. "Modernizing and Reforming the Assessment and Hiring of Federal Job Candidates," Executive Order 13932, June 26, 2020; Business Roundtable. "Business Roundtable Launches Initiative to Place Greater Emphasis on Skills in Hiring and Advancement, Improve Equity and Diversity in Employment," press release, December 4, 2020.

³² Kyle DeMaria, Kyle Fee, and Keith Wardrip. *Exploring a Skills-Based Approach to Occupational Mobility*, Philadelphia: Federal Reserve Banks of Philadelphia and Cleveland, 2020.