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Upskilling: Do Employers Demand Greater Skill When Skilled Workers are Plentiful?

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Introduction

Like most downturns, the Great Recession was particularly painful for low-skilled workers. From 2007 to 2012, the unemployment rate rose by 6.4 percentage points for workers without a college degree relative to an increase of only 2.3 percentage points for the college educated. This differential impact was evident *within* occupations as well. During the recession, college educated workers were 2 percentage points less likely to be unemployed, even after controlling for their initial occupations.

One potential explanation is the ability of unemployed, high-skilled workers to take middle- and low-skilled jobs during the downturn. Indeed, from 2007 to 2012 the share of workers with a college degree in traditionally middle- skill occupations increased rapidly, as is shown in Figure 1. This growth in skill requirements *within* occupations has colloquially become known as “up-skilling.”

It is not clear from equilibrium employment outcomes alone, however, whether the increasing share of high skilled workers in middle- and low- skilled occupations reflect only changes in worker behavior, or whether they represent changing behavior by employers as well. To the best of our knowledge, the economic literature has not yet determined

whether the education and experience requirements for job postings have risen over this period, and if so, whether this rise was driven by the state of the local labor market.

In the paper this policy brief is based on, “Upskilling: Do Employers Demand Greater Skill When Skilled Workers Are Plentiful?,” we tackle this question using a novel data set of online job vacancy postings during the Great Recession (2007-2010) and subsequent recovery (2010-2012). We find that, in bad labor markets, employer requirements rise for both education and experience, even when controlling for time, occupation, and geographical area. Our estimates imply the increase in national unemployment rates from 2007 to 2010 increased requirements for a bachelor’s degree within occupations by 2.0 percentage points and increased the fraction requiring 2 or more years of experience by 3.5 percentage points. These findings have important implications for public policy, as they could be used to inform decisions about unemployment insurance expansions and worker training programs.

Data: Measuring Trends in Employer Skill Requirements

Anecdotal reports have suggested rising demand for skills within

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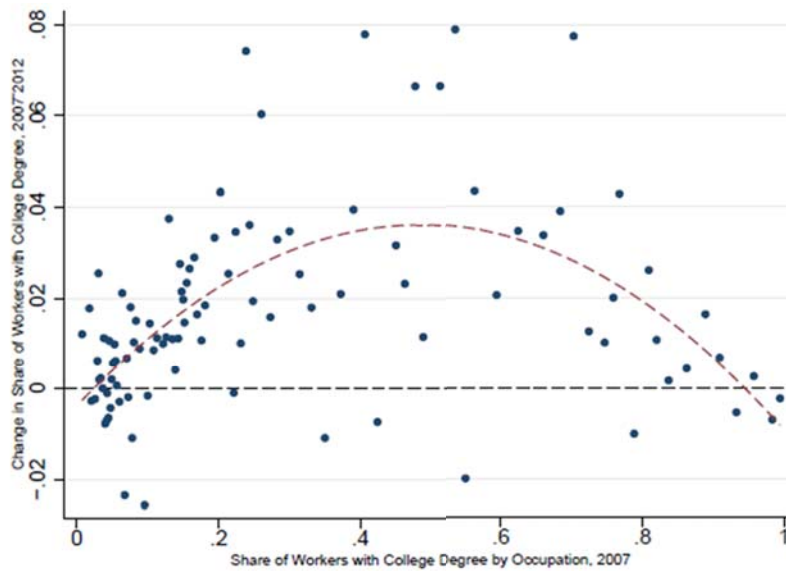
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Figure 1: Change in the Share of Workers with a College Degree by Occupation



Source: ACS 1yr PUMS, IPUMS-USA, 2007 and 2012.

occupations since 2007 is due to the larger number of available applicants per opening. For example, in a survey of 2,200 employers conducted by CareerBuilder at the end of 2013, 58 percent of respondents said they were able to hire college degree holders for traditionally high-school level work “because of the (state of the)... labor market.” Nevertheless, few researchers have been able to quantify rising employer requirements due to the difficulty in isolating labor demand from labor supply.

Our basic empirical strategy is to explore the relationship between changes in employer skill requirements and changes in local labor market conditions during the Great Recession and subsequent recovery. We are able to observe changes in hiring dynamics by using a large, detailed data set of online job postings from commercial vacancy aggregators like Burning/Glass Technologies (BGT). The great advantage of these data is that they permit us to measure requirements over time by state-occupation groupings. Using BGT’s Labor/Insight analytical tool, we collected job postings for a sample of 74 middle-skill occupations at the six-digit Standard Occupation Code (SOC) level by state for three

points in time: 2007, 2010, and 2012. In total, our sample represents 13.5 million vacancies.

Next, we collect the change in the state unemployment rate as reported by the Bureau of Labor Statistics. This will be used as our measure of labor supply for our baseline regression. Finally, we collect a bevy of basic control variables such as the share of the state population with a bachelor’s degree in 2000 and the share of the state population greater than age 35 years in 2000.

Empirical Methodology and Baseline Results

Our data allows us to isolate the relationship between weak local labor markets and rising skill requirements, and thus permits us to determine if (1) there is an increase in the education or experience requirements in job postings and (2) whether this increase is linked to the availability of skilled workers. Our dependent variable is the change in the share of job vacancies with employer requirements for skill and experience, by occupation, location and time period. We pool the changes during the Great Recession (2007-2010) and changes during the subsequent recovery (2010-2012)

and include a dummy variable for the Great Recession time period. The regression includes our control variables, including the measure of labor supply described above, as well as state, occupation, and time fixed effects. These fixed effects are used to control for a number of other factors that likely play a role in changing employer requirements over time. For example, particular occupations may be more likely to exhibit upskilling either because they are more complementary to skill biased technological change or because they are extremely specialized and post few openings. In addition, occupations requiring an initial high level of skill may also be those that experience smaller increases in skill over time. And finally, it could be that particular states have a larger pool of skilled labor that employers can draw from, regardless of the state of the labor market.

The results from this regression show that employers increase both education and experience requirements when job searchers are plentiful. Our baseline estimates (shown in in Table 1) indicate that a 1 percentage point increase in the local unemployment rate raises the fraction of jobs requiring a BA by about 0.4 percentage points and the fraction of jobs requiring 2 or more years of experience by about 0.8 percentage points. These results are robust to the addition of other controls, such as the share of openings with increased education or experience requirements at the start of the period (2007) and change in total openings 2007-2012 as a share of employment

in 2007 to control for the different turnover levels across occupations. In the context of the most recent downturn, these results imply that the nationwide increase in unemployment rates between 2007 and 2010 raised education and experience requirements within middle-skill occupations by 2.0 percentage points and 3.5 percentage points respectively. For comparison, roughly one-third of the jobs in Massachusetts in our sample require a bachelor's degree compared to 16 percent of the jobs in these occupations in Arkansas. The nationwide increase in education requirements between 2007 and 2010 thus represents roughly 1/8th of that cross-state gap. For experience, a similar calculation shows that changes in nationwide employer requirements during this period represent more than a quarter of the cross-state gap.

Using Alternative Measures of Labor Supply

Although our baseline results demonstrate a significant and positive relationship between employer skill requirements and the state unemployment rate, it could still be the case that our broad measure of state labor market conditions reflects changes in labor demand that do not affect the supply of skilled labor. For example, the state unemployment rate encompasses individuals of all levels of skill and in fact is more likely to represent individuals who are less educated or experienced as these individuals have a higher probability of unemployment. To better capture the availability of skilled labor we also make

Table 1: Relationship Between the Change in Employer Requirements and the Labor Market Slack, 2007 - 2012

	Change in Share of Posting Requesting a Bachelor's/ Graduate Degree (1)	Change in Share of Posting Requesting >2 Year Experience (2)
Δ State UR	0.440** (0.170)	0.794*** (0.172)
Observations	6,733	6,733

Standard errors (in parenthesis) clustered by state. * $p < .10$, ** $p < .05$, *** $p < .01$

use of alternative measures of labor supply including state unemployment rates for individuals with a bachelor's degree or higher as well as individuals who are age 35 years or more. We also construct supply/demand indices at the state level for six broad occupation groups measured as the ratio of the number of unemployed individuals to the number of job postings. These ratios allow us to use state fixed effects to control for aggregate shocks. Using our preferred regression specification that includes occupation fixed effects along with our other controls, we find that our results are positive and significant across all our alternative measures of labor slack.

Identification Using a Natural Experiment: Troop Withdrawals from Iraq and Afghanistan

Finally, to cleanly identify this relationship, we exploit the natural experiment associated with troop withdrawals from Iraq and Afghanistan over this period. Roughly 150,000-250,000 veterans re-entered the domestic labor force per year from 2009-2012. The timing of these drawdowns was driven by strategic and political considerations and was independent of local economic conditions. Nevertheless, certain regions and occupations received significantly larger labor supply shocks than others. We show that these state-occupation groups correspondingly experienced a significant increase in their skill requirements. For instance, logisticians (an occupation with many veterans) experienced significant "up-skilling" whereas occupational therapy assistants, an occupation with few veterans, did not. These relationships survive controls for state and occupation fixed effects, and while somewhat difficult to compare, this natural experiment implies magnitudes on the same order of magnitude as the baseline results.

Conclusion

The finding that weaker labor markets lead to rising job posting requirements is important for policymakers. Our results indicate that the demand for skilled workers is perhaps more dynamic and responsive to labor market conditions than previously thought, suggesting the need for worker training and education programs to be increasingly targeted and nimble. This means using tools like real-time labor market information (LMI) contained in online job postings to help the unemployed search more efficiently, to guide individual choices when selecting a program of study, and to design training and education programs at community colleges and other institutions that are responsive to employer demands. Since 2007 several states, including Maryland, Washington, and Michigan, have re-designed their worker training and education programs using LMI to make them more responsive to the perceived demand for skilled labor.

In addition, we document the extent to which rising skill requirements are driven by the cyclicity of the labor market, shedding light on the persistence of the increased skill demand that has been observed within occupations. The question of persistence is particularly relevant for younger workers just entering the labor market who are likely to be less skilled and experienced. Increasing employer requirements for education and experience raises the bar for these young workers at a time when firms have slashed their budgets for formal training programs. Our findings suggest that during a downturn state policymakers should consider expanding internships and apprenticeships that can give younger workers the experience necessary to gain entry into a middle-skill job. Alternatively, states could target expanded unemployment insurance benefits to younger or less educated/experienced workers who are more likely to face difficulty in regaining employment when job requirements have shifted upwards.