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**Article**

## Changes in the character of the labor market over the business cycle

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**Lisa B. Kahn** is a research associate in the NBER's Labor Studies Program. She is a professor of economics at the University of Rochester and a co-editor at the *Journal of Human Resources*.

Kahn's research focuses on understanding factors that shape workers' careers, including both external market forces such as recessions and technological change, and internal firm practices, especially those related to imperfect information. She received her Ph.D. in economics from Harvard University in 2008, and holds an A.B. in economics from the University of Chicago. She was previously an associate professor of economics at Yale School of Management. From 2010 to 2011, Kahn served on President Obama's Council of Economic Advisers as the senior economist for labor and education policy.

She grew up in Ithaca, N.Y., and currently lives in Rochester, N.Y., with her husband and their newborn daughter.

## Changes in the Character of the Labor Market over the Business Cycle

**Lisa B. Kahn**

Economists have long been interested in the immediate consequences of business cycle fluctuations. However, until recently, they have paid less attention to the lasting impacts of recessions on workers and firms. In this piece, I summarize some of my research contributions toward a better understanding of how and why recessions impact workers' careers both in the short and long run.

I begin by summarizing my work showing that the Great Recession accelerated firm-level adoption of technologies that replaced routine labor. As a consequence, workers previously employed in routine-task occupations saw their skills rapidly depreciate and faced a more difficult recovery. I next discuss how the business cycle impacts the job ladder. Workers tend to move up a wage ladder across firms, gradually making their way to higher-paying firms as they accumulate labor market experience. Recessions impede this process, resulting in halting career progression, which is especially important for young workers. Both of these areas of research imply long-lasting consequences of recessions for certain groups of workers. Finally, I describe my work quantifying the lasting impacts of recessions on careers of new college graduates.

### Technological Adoption and the Great Recession

One of the most important long-run trends in the U.S. labor market has been the shift in employment and wages away from occupations in the middle of the skill distribution toward those in the tails. This so-called polarization has been linked to technological change, whereby new machine technologies such as IT substitute for middle-skill jobs and are in turn complementary to high-skill cognitive jobs. Daron Acemoglu

and David Autor provide a survey.<sup>1</sup>

Until recently, polarization had been thought to be a gradual, secular phenomenon. However, a long theoretical literature beginning with Joseph Schumpeter's conception of creative destruction suggests that adjustments to technological change may be more episodic. In boom times, high opportunity costs, or frictions such as adjustment costs, may inhibit resources from being reallocated optimally in the face of technological change.<sup>2</sup> Recessions lower the opportunity cost and can produce large enough shocks to overcome these frictions.

Whether adjustments to new technology are smooth or lumpy is important for policy and for our understanding of recoveries. The recoveries from the last three U.S. recessions (1991, 2001, 2007–09) have been jobless: employment was slow to rebound despite recovery in aggregate output. Nir Jaimovich and Henry E. Siu provide suggestive evidence that polarization and jobless recovery are linked, showing that the vast majority of declines in middle-skill employment have occurred during recessions and that, over the same time period, recovery was jobless only in these occupations.<sup>3</sup> If these episodic employment declines were driven by lumpy adjustment to existing technologies, they would leave a mass of displaced workers with the wrong skills for new production.

In a recent paper, Brad Hershbein and I provide direct evidence that firm-level technological adoption and restructuring of employment is episodic around recessions.<sup>4</sup> We use a new dataset collected by Burning Glass Technologies of the near-universe of electronically posted job vacancies to explore changes in demand for skill over the Great Recession. Exploiting spatial variation in economic conditions, we establish a new fact: The skill require-

ments of job ads experienced a relative increase in metropolitan statistical areas (MSAs) that suffered larger employment shocks in the Great Recession. The left panel of Figure 1 illustrates our results, using as the dependent variable whether an ad contains a cognitive skill requirement. We obtain this skill measure from work I have done with David Deming to categorize a range of keywords found in the job ads data into 10 general skills, including cognitive, which includes key words and fragments like “analy,” “decision,” and “thinking.”<sup>5</sup> A hard-hit MSA sees an increase in demand for cognitive skill, relative to its starting point in 2007 and relative to a less-hard-hit MSA. We find the same effects for a range of skill requirements that are known to be complementary with routine-labor replacing technologies. Moreover, the vast majority of this “upskilling” persists through the end of our sample in 2015, even while most measures of local labor-market strength had returned to pre-recession levels.

These patterns collectively raise the possibility that a structural shift in the demand for skill occurred disproportionately in harder-hit MSAs. If such a structural shift occurred and were driven by technological change, we would expect changes in these skill requirements to be accompanied by changes in production technologies as well. Indeed, we find that increases in skill requirements are positively correlated with capital investments at both the MSA and firm levels. The right panel of Figure 1 illustrates one piece of evidence. Using the CI Technology Database from Harte Hanks, a market intelligence firm, we show that harder-hit MSAs exhibited a relative increase in IT investments, as measured by the adoption of personal computers, at the same time as they

upskilled in job postings. These differences across MSAs emerge only after the Great Recession and, once again, persist through our sample period. We also link firms in our job postings database to those in the Harte Hanks database, as well as to publicly traded firms in Compustat. We show that firms increasing their capital investments, based on PC adoption and physical capital holdings, are also more likely to upskill. Thus, increased demand for labor skill appears closely linked to both general and IT capital investment.

Taken together, our results suggest that firms in harder-hit cities were induced to restructure their production toward greater use of technology and higher-skilled workers; that is, the Great

has distributional consequences, given that low-skill workers are well known to suffer worse employment and wage consequences in recessions. Finally, this type of episodic reallocation likely plays a role in the well-noted and marked decline in male employment-to-population ratios over the past 25 years, especially since these declines have been stair-step around recessions.

## Cyclical Job Ladders

Job mobility plays a central role in earnings growth over the life cycle. Despite frictions that can inhibit worker sorting, such as search costs or imperfect information, workers are thought to

gradually climb a ladder toward better jobs and firms. This mobility is especially important for young workers, who in general move jobs often, and increasingly matters given the widening of earnings differentials across firms.<sup>6</sup>

At the same time, recessions impede worker mobility. For example, in the Great Recession, the voluntary quit rate fell by half. How does this reduced mobility impact career progression up the job ladder, and what are the

consequences for workers?

John Haltiwanger, Henry Hyatt, Erika McEntarfer, and I explore whether workers tend to move up a firm job ladder and how any such progress is impacted by recessions.<sup>7</sup> Using employer-employee matched data in the U.S., we show that in good times, workers tend to move from low- to high-paying firms. However, this mobility slows in downturns. For example, in the Great Recession, movement away from the lowest-paying firms (bottom quintile) declined by 85 percent, with an associated 40 percent decline in earnings growth.

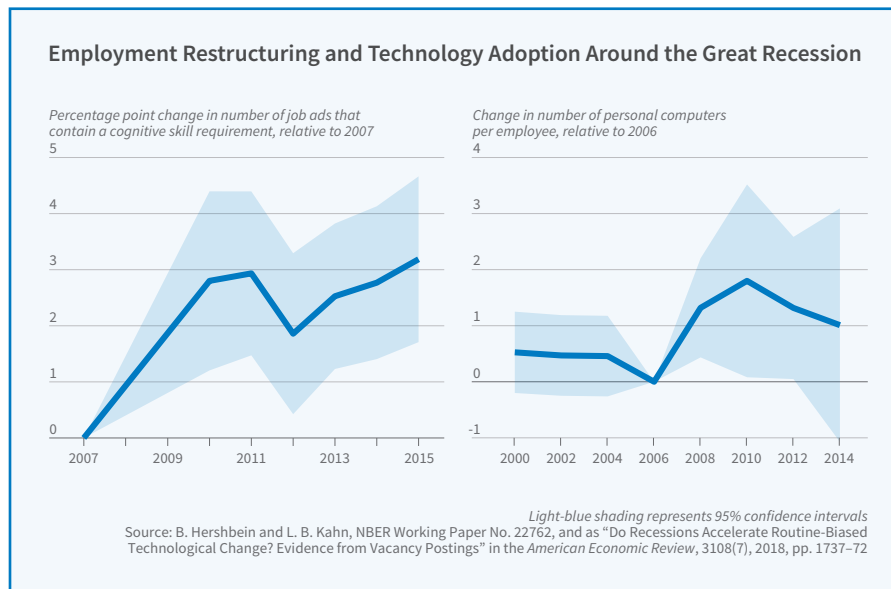


Figure 1

Recession hastened the polarization of the U.S. labor market. We demonstrate that during the Great Recession, firms changed not only whom they would hire in the recovery, but how they would produce. Instead of occurring gradually, with relatively few workers needing to be reallocated at any given time, we find that changes in demand for skill were episodic, resulting in a swath of displaced workers whose skills were suddenly rendered obsolete as firms ratcheted up their requirements. The need to reallocate workers on such a large scale may drive jobless recoveries. This also

Our evidence is consistent with the poaching models of Giuseppe Moscarini and Fabien Postel-Vinay: During slack markets, when there is less competition for workers, firms at the bottom of the job ladder can more easily retain workers who ordinarily would have been poached away.<sup>8</sup> This means workers matching to jobs in recessions spend relatively more time at firms at the bottom of the job ladder before climbing up.

Earnings losses from a lack of upward mobility may be especially important and persistent for young workers, who typically change jobs often. Given that workers are much more likely to move up the job ladder during booms and that movements up the ladder are critical for earnings growth, our findings suggest that the cyclicalities of the job ladder can have real consequences for workers' careers. These job mobility dynamics will be especially important for workers such as new labor market entrants who are forced to match to firms in recessions, for example.

## Graduating into a Recession

How costly is it to graduate during a recession? In two papers, I explore the career impacts of graduating from college into an economic downturn. I show, using panel data on white men who graduated from college between 1979 and 1989, that graduating from college during a worse local or national economy has persistently negative impacts on wages.<sup>9</sup> Even 17 years after graduating from college, those who graduated into a large downturn earn significantly lower wages (around 10 percent less) relative to those who graduated in the best times.

In subsequent work, Joseph Altonji, Jamin Speer, and I examine the differential impact of entry conditions on career

outcomes across college majors and how these effects changed over the period 1974–2011.<sup>10</sup> After a substantial data undertaking, involving piecing together seven datasets containing information on college major and labor market outcomes, we provide the most comprehensive analysis of U.S. data to date. Confirming my earlier work, we find large negative wage consequences to graduating into a downturn that persist many years into a career. Furthermore, we find that majors with typically higher earnings are somewhat sheltered, while majors that tend to earn less money suffer more from graduating into a recession.

These effects are illustrated in Figure

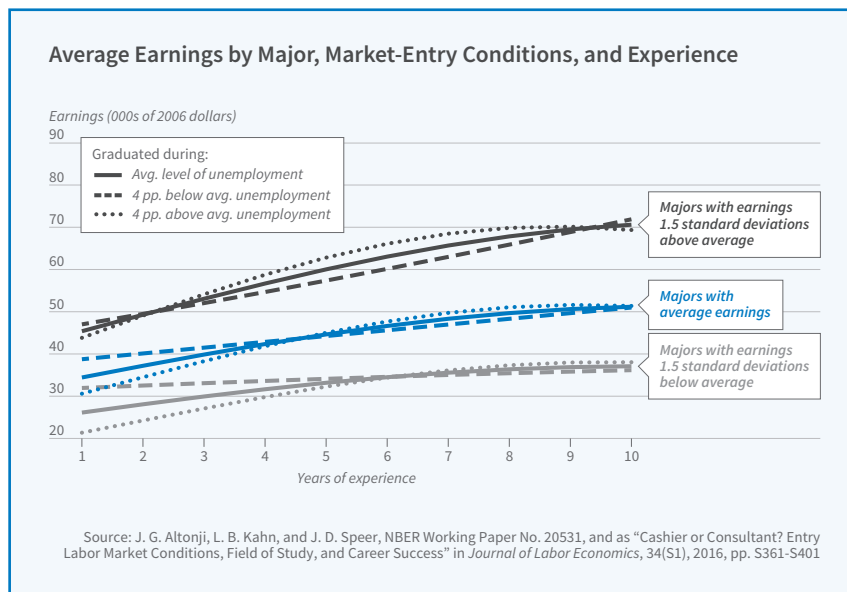


Figure 2

2, where we provide fitted earnings profiles for three types of college majors graduating into three different economies: Black lines represent high-earning majors with average pay 1.5 standard deviations above the mean (e.g., economics or electrical engineering); blue lines represent a major with average earnings (e.g., journalism or civic studies); gray lines represent low-earning majors with average pay 1.5 standard deviations below the mean (e.g., secondary education or art history). The solid lines show earnings for someone who graduated in an average economy; the dashed lines fit earnings for someone who graduated in a boom (a 4 percent-

age point below-average unemployment rate); the dotted lines show earnings for someone who graduated in a bust (a 4 percentage point above-average unemployment rate).

This figure shows several important patterns. First, the differences in earnings across majors are large and widen with experience. Second, entry conditions matter. At one year of potential experience, one can easily see the gap in earnings across boom and bust cohorts within major. The gap is largest for the low-return majors (gray lines). Correspondingly, the time it takes to overcome this gap is longest for the low-return major. We find that busts tend to widen inequality, pushing workers away from the mean, while booms tend to narrow inequality. Thus, a high-return major graduating in a bust widens his or her advantage over the average major, while a low-return major graduating in a boom narrows his or her disadvantage.

This research highlights that recessions have surprisingly long-lasting consequences for new entrants. Evidence discussed above on the cyclicalities of the job ladder can help to account for these findings, since it implies that workers who

are forced to search for and take jobs in a downturn may spend substantially more time in low-paying firms. Furthermore, weathering and recovering from a recession will be all the more difficult for workers laid off from routine-task occupations because of the concentrated technological adoption that I show took place in the Great Recession.

<sup>1</sup> D. Acemoglu and D. Autor, "Skills, Tasks and Technologies: Implications for Employment and Earnings," NBER Working Paper No. 16082, June 2010, and *Handbook of Labor Economics*,



4(B), 2011, pp. 1043–171.

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<sup>2</sup> J. Schumpeter, *Business Cycles*, New York and London: McGraw-Hill, 1939.

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<sup>3</sup> N. Jaimovich and H. Siu, “*Job Polarization and Jobless Recovery*,” NBER Working Paper No. 18334, November 2018, and forthcoming *The Review of Economics and Statistics*.

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<sup>4</sup> B. Hershbein and L. Kahn, “*Do Recessions Accelerate Routine-Biased Technological Change? Evidence from Vacancy Postings*,” NBER Working Paper No. 22762, September 2017, and *The American Economic Review*, 108(7), 2018, pp. 1737–72.

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<sup>5</sup> D. Deming and L. Kahn, “*Skill Requirements across Firms and Labor Markets: Evidence from Job Postings for Professionals*,” NBER Working Paper No.

23328, May 2017, and *Journal of Labor Economics*, 36(S1), 2018, pp. S337–69.

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<sup>6</sup> R. Topel and M. Ward, “*Job Mobility and the Careers of Young Men*,” NBER Working Paper No. 2649, July 1988, and *Quarterly Journal of Economics*, 107, 1992, pp. 441–79; D. Card, J. Heining, and P. Kline, “*Workplace Heterogeneity and the Rise of West German Wage Inequality*,” NBER Working Paper No. 18522, November 2012, and *The Quarterly Journal of Economics*, 128(3), 2013, pp. 967–1015.

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<sup>7</sup> J. Haltiwanger, H. Hyatt, L. Kahn, and E. McEntarfer, “*Cyclical Job Ladders by Firm Size and Firm Wage*,” NBER Working Paper No. 23485, June 2017, and *American Economic Journal: Macroeconomics*, 10(2), 2018, pp. 52–85.

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<sup>8</sup> G. Moscarini and F. Postel-Vinay, “*The Timing of Labor Market Expansions: New Facts and a New Hypothesis*,” in NBER Macroeconomics Annual 2008, pp. 1–52; G. Moscarini and F. Postel-Vinay, “*Stochastic Search Equilibrium*,” *Review of Economic Studies*, 80(4), 2013, pp. 1545–81.

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<sup>9</sup> L. Kahn, “*The Long-Term Labor Market Consequences of Graduating from College in a Bad Economy*,” *Labour Economics*, 17(2), 2010, pp. 303–16.

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<sup>10</sup> J. Altonji, L. Kahn, and J. Speer, “*Cashier or Consultant? Entry Labor Market Conditions, Field of Study, and Career Success*,” NBER Working Paper No. 20531, September 2014, and *Journal of Labor Economics*, 34(S1), 2016, pp. S361–401.

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