Research Digest

Elena Pastorino

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The office as proving ground

What jobs reveal about workers' abilities affects career-long earnings

The fortunes of individuals often diverge in the modern workplace. Some workers ride an elevator from the cubicle up to the executive suite, garnering big pay raises along the way. Other seemingly similar workers take a slower career path, marked by lateral moves and incremental wage increases. The least fortunate suffer demotions and terminations.

Differences in career paths and wage growth—why some workers in a particular firm or industry advance further and earn higher pay over the course of their working lives than their peers—have long intrigued labor economists. Thirty years of research indicates that it's not simply a matter of merit or seniority being rewarded. Recent research by Elena Pastorino, a visiting scholar at the Federal Reserve Bank of Minneapolis and a recently appointed assistant professor at the University of Minnesota, delves further into the dynamics of career advancement and compensation.

In "Careers in Firms: Estimating a Model of Learning, Job Assignment, and Human Capital Acquisition" (Minneapolis Fed Staff Report 469, online at minneapolisfed.org), Pastorino shows how two processes—acquiring new skills and learning about workers' abilities—intertwine to determine pay and promotion patterns in firms. Both are key to understanding aspects of labor markets such as varying levels of career attainment, worker turnover and wage inequality.

Her model, based on the career experiences of U.S. workers, highlights the role of learning. She finds that learning about ability substantially affects wages, primarily through job changes—the positions workers are assigned to by employers at various points in their careers. A job is not just a means of producing goods and services; it's a testing ground for workers that helps determine future earnings.

Two types of learning

One factor that affects the earning potential of workers is the accumulation of productive knowledge—economists call it human capital. Some workers acquire more human capital through experience or training than others and are rewarded with pay raises and promotions.

But many researchers believe

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that human capital alone isn't a sufficient explanation for why one worker fares better than another with similar education and skills. For example, some workers continuously employed by the same firm experience pay cuts despite their years of experience. And workers frequently switch firms, sacrificing firm-specific knowledge.

Since the 1970s, economists such as Boyan Jovanovic (now at New York University) have posited another type of learning that influences career paths and wages.

In addition to human capital, workers (and their employers) gather *information* capital—knowledge about which tasks and jobs are best suited to workers' abilities. A worker's productivity is revealed gradually, by performance on the job. Those who prove themselves worthy contributors to a firm's bottom line receive higher wages and promotions.

Assessing the impact of information capital on careers and wages is difficult; learning entails not only complex interactions between workers and firms, but also among firms competing for labor. Measuring the effect of these interactions requires detailed information about the experiences of individual workers—the jobs they hold, how well they perform them and the wages they earn during their careers.

Drawing on just such a rich data set, Pastorino attempts to identify these mechanisms and quantify the respective effects of learning and human capital acquisition. "If we want to look seriously at which process of information acquisition can explain what we see in the data, we have to understand what happens at the firm level," she said in an interview.

In her model, the behavior of workers and firms plays out according to rules estimated from personnel data of an anonymous U.S. company in a service industry. The records chronicle the career progress of the firm's individual managers (also unnamed) over 20 years, beginning in the late 1960s. To account for the pattern of promotions and wages in the data, the model assumes that workers increase their stock of human capital over time. Then it incorporates the concept of learning, the feeling-out process that occurs between workers and firms.

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When a worker is first hired, neither the worker nor the firm is sure about that individual's ability to perform required duties, although college grades, job references and other credentials establish baseline beliefs. If the worker performs well in a low-level job, supervisors gain confidence in his or her capabilities, and pay raises and promotions follow. An employee perceived as talented may also opt to leave the firm for a higher-paying job elsewhere.

Alternatively, one who demonstrates scant ability does not ascend the pay scale or the corporate ladder. The worker may leave the firm—either voluntarily or with pink slip in hand—to take a lower-paying position requiring less skill.

Experimenting with jobs

By integrating learning with human capital acquisition, the model reproduces the main patterns seen in the personnel data, including features that cannot be explained by human capital alone— in particular, wage decreases even for some long-time employees.

A key finding of Pastorino's research is that learning accounts for more than one-quarter of wage

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growth over the first seven years of employment, with the remainder due to increased human capital. Virtually all the impact of learning on wages comes through job changes—promotions—rather than wage changes at a given job level. The learning process leads capable workers to advance more quickly to higher-level positions that pay higher wages. "Where learning really matters is in determining the kind of job that you're assigned to, based on the information that is revealed about you," Pastorino said.

The converse is also true: Job assignment has a bearing on learning, because some jobs are more informative than others. Another important finding of her research is the extent to which firms experiment by assigning workers to jobs that are most likely to reveal ability. Certain entry-level jobs, for example, may not contribute much in terms of firm profitability, but they provide insight into important attributes such as discipline and communication skills that are also important to productivity in higher positions.

In the Pastorino model, workers assigned to low-paying jobs remain at that level for up to five years after joining a firm—consistent with the wage data and the personal experiences of many workers just starting out. The payoff for this arrested advancement—for both worker and firm—is greater insight into ability,

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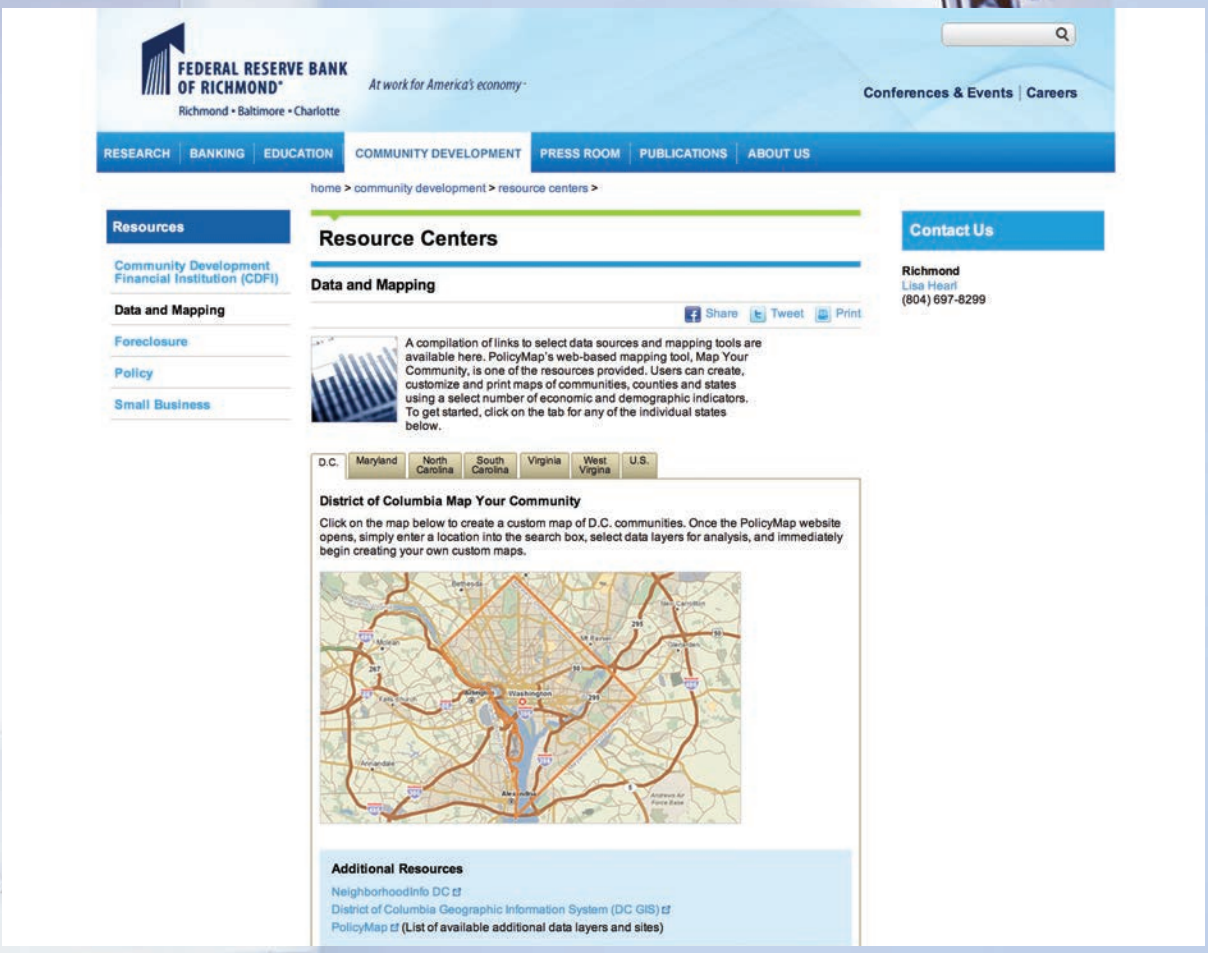
making for more productive job matches and faster wage increases later on. (In a subsequent paper, Pastorino shows that the large pay raises that often accompany promotions are in part compensation for the lower information value of higher-wage jobs.)

Pastorino doesn't dispute the strong influence of human capital acquisition on promotions and wages. It's responsible for the bulk of wage growth and explains why relatively few workers are demoted or fired: Firms value the accumulated know-how of even poor-performing employees. But her work focuses attention on a vital process—discounted by many researchers—by which firms find suitable workers and workers find jobs commensurate with their talents.

"Learning about ability does matter," she said. "Previous research found conflicting evidence on the importance of learning for career attainment and wage growth. I hope my work encourages other researchers, using the latest data and techniques, to reexamine the impact of learning on wages and careers."

— Phil Davies

Virtual Fed



The stuff of legends

Not long ago, many thought geography was a dead discipline. The Age of Exploration was over, and every corner of the earth had been charted. But with the proliferation of geographically detailed data from the government and other sources, along with the continued development of computer graphics, something of a mapping renaissance has emerged.

Federal Reserve Banks have gotten in on the action, rolling out interactive data-mapping tools, a few of which have been featured by Virtual Fed. Map Your Community is another one that's too good to overlook. To create it, the Richmond Fed's Community Development department teamed up with PolicyMap, a web-based mapping firm that produces tools to monitor economic and financial indicators of communities.

On its Map Your Community site, the Richmond Fed has packaged maps to focus on states in its district, but the last tab covers the entire United States down to county or census tract levels, and color legends tell the data tale. The site's goal is to help businesses, banks, investors and community development organizations make more informed decisions, but it's also helpful (and user-friendly) for those who want to know more about where they live.

For more, navigate your way to: richmondfed.org/community_development/resource_centers/data_mapping/index.cfm.

—Joe Mahon