Changing Employment Patterns of Older Workers

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Research Question

Most of the research examining older workers has been on the supply side, mainly focusing on the work to retirement transition. In contrast, this study will examine how employment patterns of older employees relate to workplace characteristics. The analysis will indicate which sectors of the economy have expanded their employment of older workers either through retention or new hiring and how this greater utilization of workers age 55 and older is related to production technology and employment practices by firms.

There are three well-documented trends in the employment of older workers since 2000. First, more older individuals are working than ever before. The employment-population ratio for 55- to 64-year-old workers increased from 58 to 64 percent from the beginning of 2000 to the end of 2019. It increased from 12 to 20 percent for those 65 and over. These percentages dropped during the pandemic but have since recovered to well above their 2000 levels. Second, the percentage of older workers who have been with their employer for 20 or more years increased over this period, especially for those 65 and over. Third, the odds that an older worker is in a new job have decreased substantially. Overall, these patterns imply that delayed retirement from a career job is the main reason behind the rising employment-population ratio for older workers. If more workers were relying on bridge jobs, the data would show an increasing proportion of workers with relative few years of tenure.

This study will determine the extent to which workplace characteristics can help explain these changing employment patterns of older workers. It builds upon previous work by the authors that has been supported by the Sloan Foundation. Allen and Wang (2022) studied how inter-industry differences in the percentage of older workers (defined as those 55 and over) changed between 2001 and 2019 using data from the American

Community Survey matched with various other data sources. The key findings were that the industries that had the largest increases in the percentage of older workers were the industries that had the broadest pension coverage and the industries that made the greatest use of high-tech capital. There also is evidence in 2001-07 that the percentage of older workers increased more in the industries most exposed to increased Chinese imports (albeit this really means that younger workers suffered larger job losses in those industries than older workers). They did not find evidence of (1) any shift in demand toward older workers in certain industries (as indicated by relative wages and employment moving in the same direction) or (2) any decline in employment shares of younger workers in the industries that showed the largest increases in the shares of older workers.

In other Sloan-supported research, Clark and Ritter (2020a, 2020b) document how companies are adjusting human resource policies in response to an aging workforce. Some firms are concerned about the risk of too many retirements in a short period resulting in the loss of knowledge and experience and the challenges of replacing retiring workers when the labor force is growing very slowly. In contrast, other organizations are worried about older workers staying longer than expected and the resulting challenge of coming up with the right mix of youth and experience. Their research shows that employment and compensation policies of firms influence the age structure of the organization.

A key question remains: what are the underlying drivers behind the observed changes in the percentage of older workers in an industry over time? The number of older workers can increase either because older workers stay on the job longer or more older workers are hired. Also, the percentage of older workers can increase simply because there are fewer younger workers due to a slow rate of hiring and/or higher layoff rates. To get a deeper understanding, we will pull data from the annual Job Tenure supplement of the Current Population Survey starting in 2000 to construct measures of two key indicators by industry: (1) the percentage of workers in long term jobs by age group and (2) the percentage of workers in new jobs by age group. After providing a descriptive discussion of the key patterns for these measures, we will then examine how they will relate to workplace characteristics, including pension coverage, educational and occupational patterns, the use of high-tech capital and collective bargaining.

Relevance to understanding the aging workforce

The results of this study are directly related to two of the major topics within the scope of the Economics of Working Longer initiative:

- the determinants of work and retirement behavior at older ages, including the impact of public and private pension programs on labor supply;
- how the aging workforce affects transitions between jobs and between firms, and the impact of any changes in workplace dynamism on aggregate productivity

The results of this study will provide evidence regarding which sectors of the economy have seen longer job durations for older workers and which have changed the age mix of their new hires in response to the rising supply of older workers. Our previous work focusing on changes in the percentage of older workers (55 and over) by industry showed that there is a considerable amount of interindustry dispersion both in the level of that percentage and in the rate at which that percentage changes over time. The average industry had 13 percent older workers in 2001 and 23 percent in 2019, a 10-point increase. It increased at a slightly higher rate in the 17 industries with the highest average share of older workers (11.0 points) as opposed to the 14 with the lowest (8.2 points). Among the industries that have the highest share of older workers, the increase in their share ranged from as low as two percentage points (railroads) to as much as 15 points (paper, utilities). Looking at the industries that have the lowest share of older workers, the change ranges from a low three points in motion pictures and restaurants to a high of 13 points in rental and leasing services. The change in the age mix of employees is far from a uniform process across industries. We expect that to be the case for the age distribution of new hires and the percentages of workers in long term jobs as well.

The basic patterns in the hiring and retention data should be of considerable interest in and of themselves. Compared to Europe and Japan, international studies generally claim the US has a more flexible labor market. Looking at hiring and long-term job holding patterns in the US over the last 20 plus years will provide a direct look at whether and how workplace transitions have changed.

Once the stylized facts about hiring and long-term job holding by industry are established, this study will examine the underlying determinants. Pension coverage is likely to be a key factor behind retirement decisions; it varies considerably across industries. The impact of pension coverage on retirement decisions depends on the type of pension plan. Defined benefit plans provide strong incentives to retire at ages of early and full benefit eligibility because of the increases in pension wealth that take place at those ages. Most private sector workers are covered by defined contribution plans, whereas defined benefit plans dominate in the public sector. This study will be able to establish whether interindustry differences in pension coverage relate to changes in long-term job holding.

Another key focus will be on the role of technology in the workplace. In some cases, new technologies offset performance limitations associated with the aging process. Robots reduce the physical demands of some production jobs; search engines augment human memory. Yet some aspects of the latest technologies provide challenges to older workers, including issues arising from technology design (especially on small mobile devices) and social norms associated with technology (email versus text messages). Allen and Wang (2022) found that industries with the largest high-tech capital/labor ratios had the largest growth in the percentage of older workers; this study will provide further insight into how high-tech capital influences retention and hiring patterns by age group across industries.

Data:

This project primarily will use data from the Job Tenure supplement of the Current Population Survey. The supplement was conducted annually from 1996-2020 and then shifted to a biannual basis in 2022. These data will be used to calculate new hire rates by age and the percentage of middle-aged and older workers in long-term jobs for major industries (usually at the two-digit level of aggregation). We propose to examine changes over the past two decades and speculate on how past and current trends might predict future demand for older workers.

The employment data will be merged with data on output (real value added) and capital (current-cost net capital stock of private nonresidential fixed assets) from the Bureau of Economic Analysis. The BEA capital data contains detailed annual breakdowns of 96 different types of capital for 62 industries, including various types of equipment (such as computing equipment and instruments) and intellectual property products (including software). In the empirical analysis total capital is defined as the sum of equipment, structures, and intellectual property projects (IPP). To determine whether the employment of older workers is impacted by advanced technology, the capital coefficient will be allowed to vary with different types of capital associated with information technology, instrumentation, and intellectual property. These data are readily available as public use spreadsheets from BEA.

We also will explore capital data for the US and other OECD countries in the EU KLEMS data base. The advantage of using the EU KLEMS data is that measures from other OECD countries can be used as instruments for the US data to examine endogeneity issues. The downside is that the EU KLEMS data is more highly aggregated than the BEA data.

The CPS Annual Social and Economic Supplement (ASEC) will be used to estimate pension coverage by industry; Form 5500 data from the IRS will be used to estimate the breakdown between defined benefit and defined contribution plans. Collective bargaining coverage will also be estimated using monthly outgoing rotation groups in the CPS. Both measures are available annually. The CPS also can be used to construct separate measures for private sector and government employees.

Methods:

This study builds upon work by the investigators that was supported by the Sloan Foundation. They developed a data set on changes in the age structure of employees by industry over the last 20 years. This data is being used to examine how employer demand for older workers varies across industries and how it changes over time within industries. The goal is to estimate reduced-form labor demand models.

Changes in the age structure of an industry over time depend on the new hire rate, the age distribution of new hires, the exit rate, and the age distribution of those exiting. Companies that employ larger numbers or proportions of older workers will do so by either hiring more older workers or retaining them for longer. Economic research has focused on supply-driven factors behind the higher employment-population ratios observed from the 1990s through 2019. This study will examine the micro-determinants of employment of older workers by industry, focusing on the age distribution of new hires and the retention pattern (by age) of those hires. We expect to find sizable differences across industries in these age distributions along with significant within-industry differences over the last 20 years.

The CPS survey of employee tenure will be used to calculate the age structure of new hires by industry. One focus will be on the percentage of new hires who are 55 and over. This will be a descriptive analysis that provides information on how hiring rates of older workers relate to the existing age distribution, output growth, and industry characteristics such as capital-intensity, use of IT capital, collective bargaining and pension coverage. The underlying question will be to determine which industries are most open to hiring older workers, what features of those industries appear to drive that decision, and how have hiring patterns of older workers have changed over time within an industry.

The other focus will be on the percentage of older employees in long-term jobs, where a long-term job is defined as one lasting at least 10 or 20 years. The key question will be how these inter-industry patterns relate to output growth, capital intensity, the use of high-tech capital, collective bargaining, and pension coverage.

The empirical specification will be like that used in recent papers by Acemoglu and Restrepo (2020, 2022) and Allen and Wang (2022). We will begin with a cross section analysis of inter-industry differences in hiring rates of older workers and then extend to how the hiring rates have changed over time, focusing on multi-year periods such as 2000-2007, 2007-2010, and 2010-2019. Let H_{jt} = percentage of new hires age 55 and above in industry j in year t, K_{jt} = a vector of capital measures, X_{jt} = a vector of control variables (including pension coverage and percentage union) for a cross section model, Y_{jt} = a vector of control variables for a first difference model and e_{jt} and ε_{jt} are the corresponding error terms. The cross-section model will be $H_{jt} = ßK_{jt} +$

$\varphi X_{jt} + e_{jt}$, where ß and φ are vectors of regression coefficients; the multi-year first difference model will be $dH_{jt} = \alpha dK_{jt} + \delta Y_{jt} + \varepsilon_{jt}$, where α and δ are vectors of regression coefficients and dH_{jt} and dK_{jt} represent first differences in H_{jt} and K_{jt} respectively. In addition to OLS estimates of the two models, we will explore 2SLS estimates with K_{jt} values from OECD countries in the EU KLEMS data base used as instruments.

The analysis of the percentage of older workers in long term jobs will be conducted similarly. The key questions will be how these inter-industry retention patterns relate to the use of high-tech capital, pension coverage and union density, along with how they have changed over time. The empirical procedure here closely parallels the one outlined above for hiring rates, starting with cross sectional variation, and proceeding to within-industry differences over time.

Although the primary focus of the analysis will be on the trends from 2000 through 2019, the data collection process also will provide the opportunity to examine what happened to new hires and long-term jobs during the pandemic. The employment-population ratio for the 55 to 64 age bracket dropped from 63 to 56 percent in April 2020, but now has recovered to 63 percent. Given the high volume of quits that is also taking place during this same period, there are likely to be some valuable insights from looking at how hiring and job duration patterns for older workers have adjusted.

References

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Clark, Robert and Beth Ritter (a), "How Are Employers Responding to an Aging Workforce?" *The Gerontologist*, Dec. 2020, 60(8): 1403-1410.

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BUDGET Year 1

A. Senior Personnel					
Name	Title	Annual Salary			
Clark, Robert	Co-PI	$214,884	Summer salary		$0
			Academic year salary	0.60 months	$14,326
			Academic year % effort	6.7%	
Allen, Steven	Co-PI	$215,027	Summer salary	1.58 months	$37,673
			Academic year salary		$0
			Academic year % effort	0.0%	
Total summer salary					$37,673
Total academic year salary					$14,326
Total senior personnel salaries					$51,999
B. Other Personnel					
Hourly Research Assistant			Up to 394 hours @ $25/hour, max of 20 hour/week		$9,850
Total Salaries and Wages (A + B)					$61,849
C. Fringe Benefits					
Faculty and Professional Staff academic year (31.34% if TSERS, 22.79% if ORP, +Health Insurance)					$3,733
Faculty and Professional Staff summer (31.34% if TSERS, 22.79% if ORP)					$8,586
Total faculty and professional staff fringes					$12,318
Post Doctoral Associates (8.45% + Health Insurance)					$0
Graduate Assistantships (8.45% + Health Insurance)					$0
Hourly paid students (8.45%)					$832
Total Fringes					$13,151
Total Salaries, Wages and Fringe Benefits					**$74,999**
I. Indirect Costs					
Indirect Cost Item	Base Amount		Rate		
MTDC	Year 1	$74,999.34		12.0%	$9,000
J. Total Direct and Indirect Costs					$83,999